

THE IRON AGE

THURSDAY, MARCH 15, 1888.

Joliet's Industries.

On the 28th ult. a very interesting meeting was held at Joliet, Ill., by the Business Men's Association of that growing city. After discussing an elaborate menu the members and their invited guests listened to a number of speeches by gentlemen prominently connected with Joliet's industries. Among the principal speeches of the evening was a thoughtful review by Mr. William R. Stirling, treasurer of the Joliet Steel Company, who took for his text "The Bessemer Steel Industry in Its Relation to the United States." Mr. Stirling clearly showed by a series of statistics on the development of our natural

you will be surprised when I state that it required the consumption of $4\frac{1}{2}$ tons of raw materials at the works of my company (and they are as well located as any) in 1887 in the manufacture of each ton of rails that each ton of raw material was moved an average distance of 412 miles at an average freight cost of \$2.04 per ton—or, in other words, the outlay for freight on materials used for each ton of rails manufactured amounted to \$9.53." Mr. John Lambert, the well-known president of the Lambert & Bishop Wire Fence Company, in some brief remarks gave the following statistics of Joliet's principal factories: "The steel mills produced more tons of steel rails in 1887 than any other

per car of C. L. freight was on the Pennsylvania Railroad in September—say 15 tons per car; and the highest average loading of L. C. L. freight was on the Baltimore and Ohio Railroad in August, 1887, 7 tons per car.

Improved Hoisting Machinery.

We print in this issue engravings showing a general view and details of one of the improved hoisting plants manufactured by the Webster Camp & Lane Machine Company, of Akron, Ohio.

The plant consists of four drums, 8 feet diameter, having a capacity for 1150 feet of $1\frac{1}{4}$ -inch wire rope, driven by two

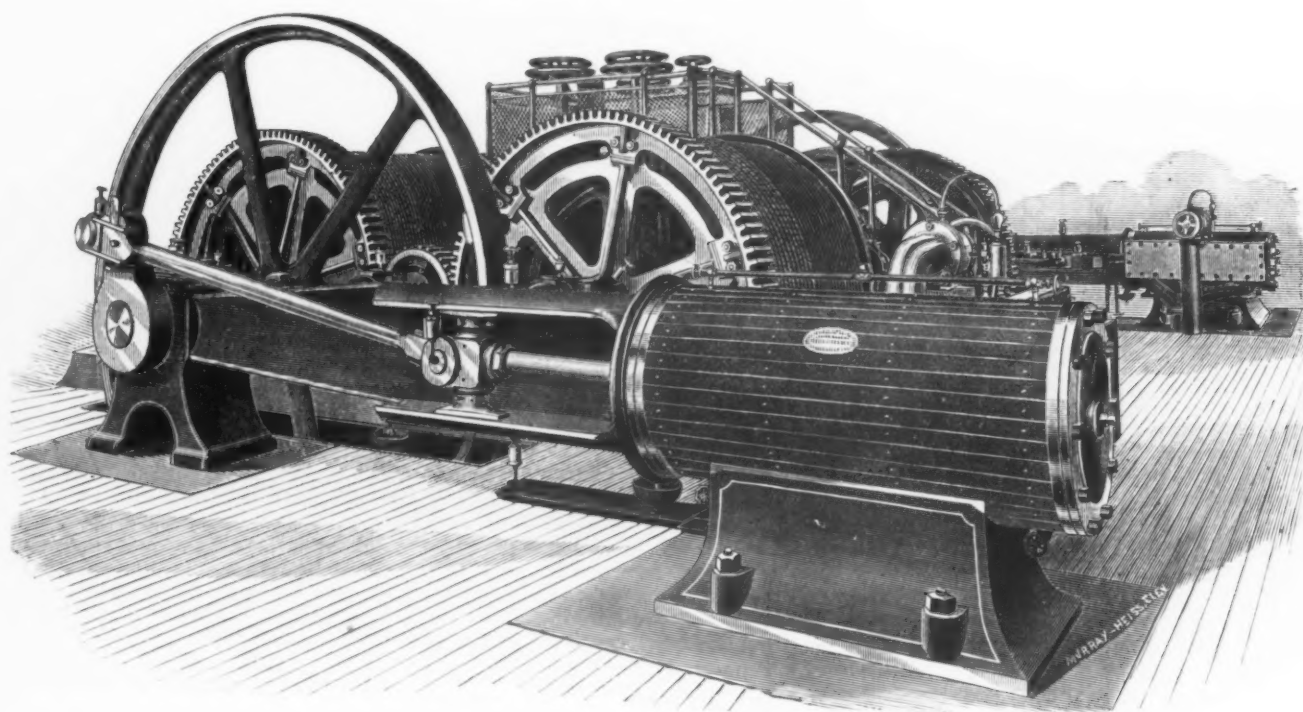


Fig. 1.—General View.

HOISTING PLANT AT THE MINES OF THE CLEVELAND IRON MINING CO., AT ISPHEMING, MICH., BUILT BY THE WEBSTER, CAMP & LANE MACHINE CO., AKRON, OHIO.

resources that the manufacture of steel had revolutionized the freight traffic in this land. He quoted the following figures, which are certainly startling:

"On the Lake Shore and Michigan Southern in 1870 out of the total 2,978,725 tons of freight carried, $15\frac{1}{4}$ per cent. consisted of coke, coal, stone, pig and other iron and $42\frac{1}{4}$ consisted of grain provisions, agricultural products and animals. On the same road in 1886 out of $8\frac{1}{2}$ million tons freight carried, $35\frac{1}{4}$ per cent. consisted of coal, iron, &c., and only 28 per cent. of grain and agricultural products. (The percentage of merchandise and other articles had risen, moreover, from $15\frac{1}{4}$ to $19\frac{1}{4}$ per cent.) You will observe that the total tons of coal, iron, &c., in 1886 were alone equal to the entire tonnage of freight carried on that road in 1870. On the New York Central Railroad in 1867 58 per cent. of the total freight traffic consisted of agricultural products. In 1886 this had fallen to 35 per cent. And so the story might be repeated by quoting figures from many other roads."

Another interesting statement by Mr. Stirling was the following: "I think

works in the world—viz., \$7,585,000 worth. They employ 1700 men, paying out \$1,500,000 per year. The wire and barb wire business of this city employs 2250 men and pays out \$1,522,000 per annum and make a product of \$9,850,000 per year. This is the largest product of any city in the United States. In 1887 we made 24,000 tons of barbed wire, enough to make a three-strand fence around the globe."

Mr. Albert Frick, last month, before the Interstate Commerce Commission, stated that the average weight of freight carried in less than carload lots in 11 ton cars, was $5\frac{1}{2}$ tons, while in carload lots they contained $14\frac{1}{2}$ tons. This average weight of loads in cars was ascertained from 1672 carloads and 4112 less than carloads forwarded from New York to the Western termini of the trunk lines, over six trunk lines in the last half of the months of June to August, a separate month being taken for each Trunk Line, so as to present as near as possible the average conditions of the business during half a year. The highest average loading

engines, 22-inch bore 42-inch stroke, having adjustable Meyer cut-off valves. These drums are intended for independent hoisting—especially for iron ore—each drum hoisting from a different shaft or skip road, using the Cornish skip or self-dumping car. The engines are intended to run at full speed, controlled by a governor which, in this case, is placed on the steam pipes under the floor. The cut-off valves are adjusted by a hand wheel, located on operating platform.

The gear wheels are loose on drum shaft, as shown in the sectional view, Fig. 2, with a taper composition bushing in the hubs, which can be removed for renewal without taking out the drums. The gears, as shown, have a friction ring on the inside on which the driving friction of the drums engage. The clutch is of an improved band-friction type, specially designed by the builders, and is shown in detail in Fig. 3. The driving band is lined with vulcanized fiber, though basswood blocks are largely used. Automatic lifters are employed to raise the band from the surface when the band is loose. The friction clutches are connected with, and

operated by, the lower hand wheels shown on the operating platform in Fig. 1. The upper hand wheel is connected with the lowering brake which is a powerful band brake lined with basswood blocks. The advantage of this method of applying the clutch is that being inside the drums, the plant is made more compact and the drums are noiseless in their operations, and the empty skip may be lowered back with as great rapidity as the condition of the tracks will warrant, in some cases running back 1800 feet per minute. The ease and certainty with which these drums can be operated make them well adapted to their work.

The plant illustrated is in use at the mines of the Cleveland Iron Mining Company, at Ishpeming, Mich. A 12-foot plant of the same style is in use at the Ludington mine, Iron Mountain, Mich.

explosion, to insure its perfect work, and herein consists one of the chief and distinguishing merits of this invention. The havoc and wrecking power of Lieutenant Graydon's projectile, are, of course, intensified by the velocity with which it travels and the tamping or solidifying thus imparted to the explosive, augmenting its force, whether in the penetration of armor or other obstruction.

The Breakage of Heavy Forge Steel Shaftings.

Mr. M. H. Koppmayer, who is connected with the Pencoyd Works, near Philadelphia, has lately contributed to *Stahl und Eisen* a paper embodying the general results of a series of experiments which have been carried on over a num-

axis of the shaft. After filling them they were singly heated on their circumference either by Bunsen burners or in a forge fire to a temperature about equal to that created by a hot box. The disks thus heated were plunged into water and moved about in it, were thoroughly examined, dried and heated again, this manipulation being repeated up to 50 times. The idea was to imitate as closely as possible the conditions existing when a heavy shaft is heated by a hot box and is cooled again by a stream of water, with the object of tracing the changes thus brought about in the interior of the shaft. The greater number of the disks, especially in the case of those whose core was only porous or had smaller or larger round or oval cavities without jagged fractures or cracks, the heating and cooling could be repeated 50 times and over without leading to any

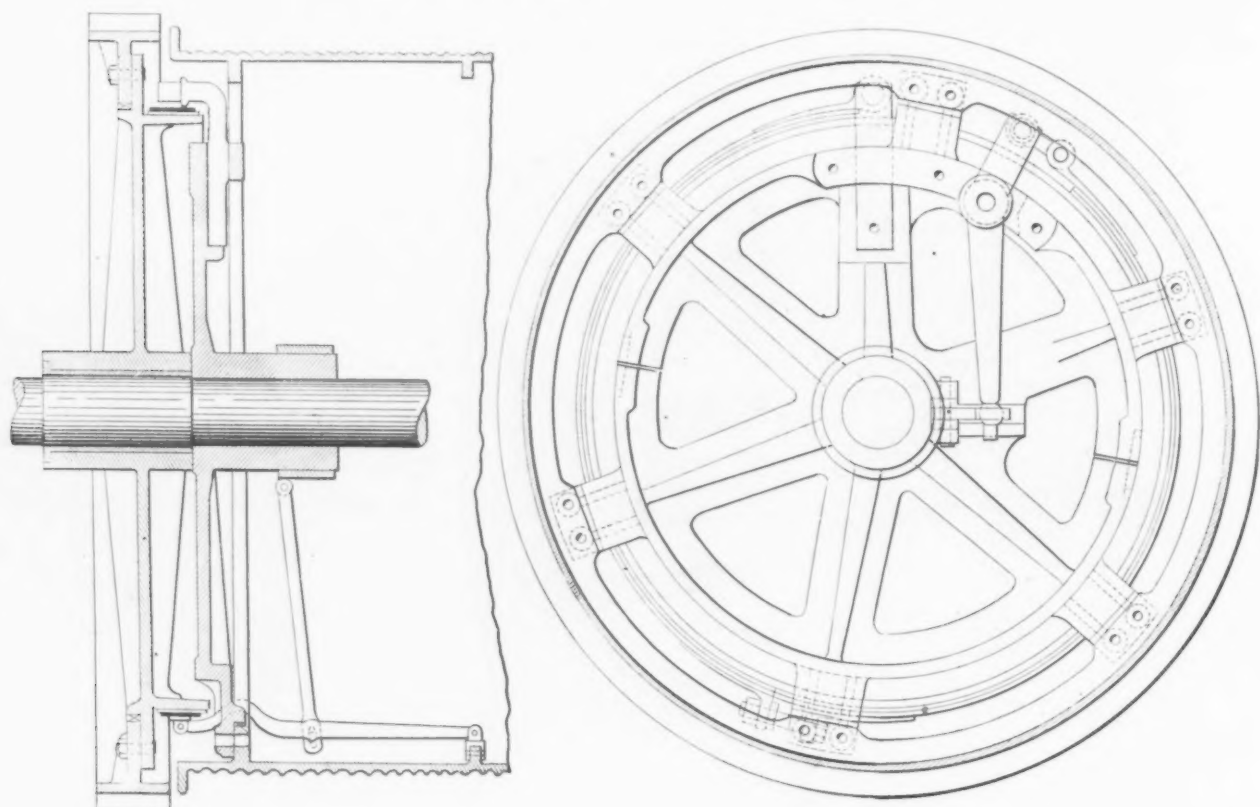


Fig. 2 and 3.—Vertical Section and Side View of Drum, Showing Clutch Arrangement.

DETAILS OF HOISTING PLANT AT THE MINES OF THE CLEVELAND IRON MINING CO., AT ISHPERING, MICH

The company also furnish these plants with automatic cut-off engines of the style illustrated in *The Iron Age* of April 15, 1886.

The discoveries of Lieut. James W. Graydon, late of the United States Navy, have proved, beyond a doubt, and by severe and satisfactory tests, the adaptability of high explosives to the practical uses of war, and that dynamite and its kindred substances may be utilized with phenomenal effectiveness, even in the firing of ordnances as at present constructed. Lieutenant Graydon's invention consists in firing dynamite shells from modern guns or cannon, with the full service charge of powder and with no danger from heat or shock, at the same time securing the entire range desired and the complete penetration of the target by the shell before the dynamite is exploded, the penetration being absolutely necessary in order to obtain the full destructive power of the explosive. It has been shown by different experiments, both in the United States and abroad, that the projectile must effect a penetration before

ber of years. Mr. Koppmayer found in investigating broken steel shafts that all of them showed interior defects, which could either be traced on the surface of the fracture or could be found by turning them off near the break. These interior defects generally appear in the form of porous or unsound spots, as cracks and irregular cavities, the size of which increases with the diameter of the shaft, and which are generally distributed along the axis. There may be some difference of opinion, whether or not these defects are due to casting of the ingots or were created or rendered worse during the forging, but it is a fact that such defects are found in heavy forged steel shafting, even when extreme care was taken in their manufacture and, when, after turning and breaking, they showed a sound surface and a homogeneous core.

Mr. Koppmayer has made the following experiments to show that these interior defects may lead to breaks: From heavy shafts, in which such defects have been found, a series of disks about $\frac{3}{4}$ -inch thick were taken by cutting vertically into the

changes in the structure of the disk. With others, especially those showing a core with cracks, fractures or irregular cavities with sharp edges, it was observed that when so treated a short, fine crack was formed, starting from the defective place. In the case of one disk this was observed after the eighth heating, with three others only after a much longer period. In the case of two disks the treatment was continued after the appearance of the fine cracks, and it was shown that it grew longer during the heating. When the disks were again cooled in water and reheated the crack grew longer again. This process proceeded slowly in the beginning, but grew as the crack approached the surface of the shaft. Sometimes the crack enlarged suddenly, a slight noise accompanying the fracture. In all the disks treated in this way not a single case occurred that the crack started on the surface of the shaft. Mr. Koppmayer concedes that the chemical composition of the steel, shocks and blows and defective mounting may favor the formation and the

growth of interior cracks, but when a comparison is made between the phenomenon observed on the treatment of steel disks as carried through and the character of broken steel shafts, a striking similarity will be noted. An explanation is furnished of a good many breakages of heavy forge steel shafts. In the case of most of them the cracks can be shown to have some relation with the defective spot in the interior of the shaft, and the gradual development of the break may be observed. Generally they take place in or near the bearing—that is, at such points where they have become hot. Cracks in shafts of this class are serious, because they extend in the interior, and when the shaft happens to be heated again, may bring about a fracture. The longitudinal crack, as experience has shown, when extending from the bearing, gradually turns and finally extends squarely across the shaft.

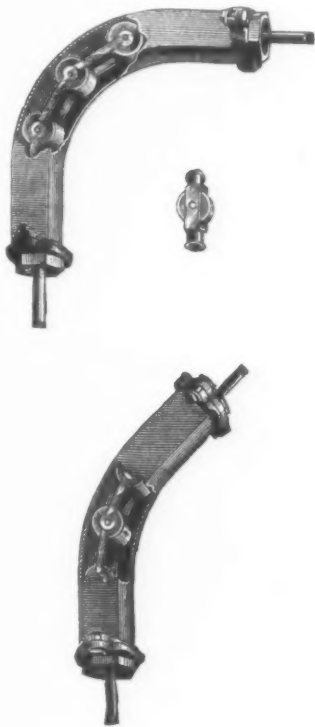
The experiments with the disks had lead Mr. Koppmayer to the conclusion that interior defects may cause a fracture, and with this as a starting point, he instituted further experiments with the object of possibly proving that if these interior defects can be removed, then the cause for breakage is avoided. This he did by boring out the defective spots. He chose two disks which had already shown the beginning of the formation of cracks resulting from interior defects, and in which the repetition of his manipulation would have caused their extension to the surface of the shaft. After drilling out the entire core, two disks were treated exactly in the same way, but it was impossible to observe the formation of a crack even after 50 repetitions and after the heating had finally been carried to redness. This would appear to confirm the accuracy of the supposition that the removal of the source of danger avoids the possibility of breakage. When the diameter of the core removed bears the relation to the diameter of the shaft as 1 to 3, the strength of the latter is not appreciably decreased; still, on the other hand, it furnishes a guarantee that in most circumstances all interior defects, as they occur in heavy shafts, are removed. The boring out of shaft and crank pins is costly, but the additional expense is more than compensated for by increased safety and durability.

The Syracuse Steel Foundry Company, of Syracuse, N. Y., is a new corporation which succeeded on the 1st of January to the steel casting business that had been established by the Frazer & Jones Company 18 months previously. In this short period the business grew too large for existing facilities, and new arrangements were rendered imperative. A 10-acre tract of land in a western suburb of Syracuse, lying between the Auburn branch of the New York Central and Hudson River Railroad and the Erie Canal, was purchased on account of its desirable location, and new works were erected, which were occupied in January. The old works contained a single 16-pot crucible steel furnace. The new establishment is of treble that capacity, containing three 16-pot furnaces, capable of producing from two to three tons of steel castings daily. The building now in use is a one-story frame, 190 feet by 160 feet, but extensions will be made whenever deemed desirable or rendered necessary. At present only crucible steel castings are made, with a maximum weight of 900 pounds, but the erection of an open-hearth steel furnace is contemplated to make large castings. The facilities of the works are now of such a character that a casting for a break-down job can at any time be turned out in 48 hours after the pattern is received. The nature of the metal in these castings does not make it necessary to put them through a tedious annealing process, as they are soft and

tough without it, but merely a few hours' heating to relieve casting stresses is deemed advisable when it can be done, the saving of time thus accomplished being an important factor in getting hurried orders out quickly. The fact should be noted that the change in the name of the company does not carry with it a change in proprietors, the ownership and management continuing as before. Fred. Frazer is president, Geo. P. Hier, vice-president, R. W. Jones, secretary, and Geo. S. Hier, treasurer.

A Flexible Piston Rod and Elbow for Pumps.

Heretofore it has been absolutely necessary where wells have exceeded 20 or 25 feet in depth to place the pump standard directly over the well, so that the cylinder



Flexible Piston Rod and Elbow, made by the Goulds Mfg. Co., Seneca Falls, N. Y.

would be in direct line with the standard above. The Goulds Mfg. Company, of Seneca Falls, N. Y., however, are now introducing what is known as Schrankel's flexible piston rod and elbow, which makes it possible to place the pump standard at any point desired without reference to the well. There may, in fact, be a separation of several hundred feet and yet the pump, we are told, will work no harder than if it was used in the old-fashioned way.

The engravings, which we annex, will explain the nature of the device. A 90° elbow, of which two will be required where the top of well and the bottom of pump standard are situated in the same horizontal plane, or nearly so, is made of cast iron about 2 inches square inside, in cross section, with slotted ears at either side of each end for bolting on the gas pipe connections, into which the connecting pipes are screwed. In an elbow of this description, for a 6-inch stroke pump, the flexible rod consists of six 2-inch turned-iron rollers, fitting the elbow at the top and bottom to prevent buckling. These rollers are connected together by brass straps or links, with steel shafts passing through their centers, forming axes of the elbow as the pump lever imparts the reciprocating motion. There is ample room on each side of these rollers and

straps for the water to pass up in its ascent to the standard, the effort required in the operation being no more than in ordinary pumping. The roller sockets are made of brass and iron, and roll back and forth in the pipe with trifling resistance, thus contributing to the easy working of the pump.

These flexible rods, we understand, have already been used in a number of places with most satisfactory results. Aside from the uses already mentioned, they admit of supplying two or more pumps from one well.

Cable Systems for Street-Car Propulsion.

Messrs. Doane and Plimpton, engineers of the West End Street Railway Company, of Boston, Mass., have just submitted to the company a report on the cable railway systems of a number of cities, including Chicago, St. Paul, Kansas City, St. Louis, Cincinnati, Philadelphia and New York. From it we extract the following interesting particulars:

All the companies have from two to four times as much engine power available as they are likely to use at any one time, and one and one-half to two times as much boiler power. All engines with automatic cut-off.

South Chicago.—At Twentieth and State streets there are a pair of engines of 500 horse-power each, and a duplicate set, making 2000 horse-power altogether, running 20 miles of cable. At Cottage avenue and Fifty-fifth street (Hyde Park) two engines, 1000 horse-power each, running 10 miles of cable. At State street and Fifty-second street, one pair 250 horse-power engines, equal to 500 horse, running about five miles of cable. All of the above are of Jerome Wheelock make, Worcester, Mass.

North Chicago.—Two pairs of engines of 500 horse-power each, cylinder, which gives 2000 horse-power, to run about eight miles of cable. Engines made by Robert Wetherell, Chester, Pa.

St. Paul.—A double engine, each cylinder 314 horse-power, equal to 628 horse-power. No spare engine, but one cylinder can be detached. To run five miles of cable. Makers, Allison & Son, Port Chester, Pa., and it is such an engine as is used at the Pennsylvania coal mines.

Kansas City.—The Metropolitan Company runs the Hamilton Corliss engine at both its houses, double, each 450 horse-power, equal to 18,000 horse-power. They can be coupled together or run separately; 16½ miles of cable. The Grand Avenue Cable Company, at Grand avenue and Fifteenth street, have a pair of Reynolds Corliss engines, each 423 horse-power; can be run separately or together; runs three ropes of 14 inches length altogether. Maker, Allis, of Milwaukee.

St. Louis.—The Citizens Company have a pair of some type of Corliss engines, of St. Louis make, each 500, equals 1000 horse-power; can be run together or separately. They are now running 5½ miles, and expect soon to run 12 miles of cable.

Cincinnati.—Walnut Hills station; two separate engines, can be run together; Hamilton Corliss make; one about 415 horse-power; the other 540 horse-power, or 955 horse-power; run eight miles of cable in two ropes of about four miles each.

Philadelphia.—There are at the Sansom street power house two engines, each 250 horse-power, running eight miles of cable on Seventh and Ninth streets. They are of the Wetherell make.

New York.—A pair of Wright engines, about 475 horse-power each, running 11 miles of cable; can be run together or separately; also a small engine for running the extra cable slowly.

The horse-power of engines per mile of cable is as follows:

	Horse-power.
South Chicago, Twentieth and State.....	100
South Chicago, Cottage, Gro. av. Hyde Park.....	200
South Chicago, State and Fifty-second streets.....	100
North Chicago, will add more cable.....	250
St. Paul.....	125
Kansas City, Metropolitan railway.....	110
Kansas City, Grand Avenue railway.....	69
St. Louis, Citizens' Railroad Company.....	83
Cincinnati.....	120
Philadelphia, Sansom street.....	62
New York.....	86

It will be seen from the above that the average practice is to provide a fraction over 100 horse-power for each mile of cable run. This power consists one-half in the necessary power to run the cable to speed with its load of cars, with somewhat of surplus, and one-half in a reserve power, which is to be brought into use in case of a breakdown or in case there is need of repairs.

The boilers generally in use are horizontal, 5 feet in diameter, 18 feet long, set in batteries of three or four. At South Chicago the tripod boilers of the porcupine type are being used. They are quick steam makers, and are said to be economical of fuel, but have hardly been in use long enough to test their wearing qualities. The universal size of the cable now in use is 1½ inches in diameter. It is made of six strands, each of several wires twisted, and the whole twisted about a central core or strand of hemp. In splicing the ropes the six strands are untwisted from 15 to 60 feet on each end. The two ends to be joined are then placed together, so that those untwisted strands from one end alternate with those from the other end, and the original twisted parts are in close contact. A strand is still further untwisted, and is replaced by the opposing one from the other rope, and so on, half one way and half the other. The ends of the six strands are cut off at different points, the center hemp strand is cut out at these points, and the ends of the wire strands are pushed into its place. The cut ends are in this way left in the center of the rope, and the spliced rope retains its original size all through.

The cables weigh 2½ pounds per foot. Their maximum wear is about 12 months in time or 60,000 miles in distance. When they have stretched 1 per cent. in length they are supposed to be worn out or no longer safe. The cables largely in use are made by the John A. Roebling's Sons Company, Trenton, N. J. Cables should not be exposed to water running in conduit, as it takes off the tar and oil, and they never should drag in the dirt, as that wears them out and all parts with which the rope comes in contact in its passage. The following table shows the speed of cables:

	Miles of cable.	Miles per hour.
South Chicago.....	1	7
South Chicago.....	9	10½
South Chicago.....	10	11½
South Chicago.....	5	14
South Chicago.....	10	14
North Chicago.....	8	8
St. Paul.....	5	8
Kansas City.....	6	8½
Kansas City.....	2	7½
Kansas City.....	6	8½
St. Louis.....	6	8
Cincinnati.....	8	8
Philadelphia.....	8	8
New York.....	11	8

The principal grips seen are known as the Hovey grip (in use in South Chicago and one very much like it in New York), the Root grip, in use in Kansas City and St. Louis, and the Lane grip, in use in Cincinnati—all of which are vertical working grips, that is, they take hold of top and bottom of cable. There is another style in use in Philadelphia, which grips the cable horizontally; the two jaws are hinged below the cable, and so prevent-

ing the dropping of the cable, unless it is lifted out. Grips and all their parts are made to patterns and interchangeable, at a cost of about \$100 each. Each grip car should be provided with two grips, one of which is idle or in the shops. The material used in contact with the cable is various. In South Chicago brass is used; in Kansas City and St. Louis, soft cast iron; in Cincinnati, Jessop's steel, untempered; in Philadelphia, soft cast iron, and in New York, cast iron. The cable, while in the grip of the car, runs about 12 inches below the street surface.

There are three principal styles of cars in use. The South Chicago Company uses a grip car, which is an open car, with the grip man standing in the middle. He has a good view of the surroundings, and is himself not in especial danger in case of a collision. To it from one to two or three or four common horse cars may be hooked on. Another, in use only on the Grand avenue line, Kansas City, is a combination car, open in the front part, in the center of which the grip man stands, while the rear end is a box or covered car. Each part sits 20 passengers, or 40 in all. They are eight-wheel cars, running on two trucks like steam cars. The third, and the style in most general use, for instance, at St. Paul, St. Louis, Cincinnati, Philadelphia and New York, is a common box car, with the grip man on the front platform.

The experience in regard to the horse-power required to haul a car are very varied:

	Horse-power per car.	Miles per hour.
South Chicago.....	¾	7
South Chicago.....	2½	12
Kansas City.....	4	8
St. Louis.....	6	8
Cincinnati.....	7	8
Philadelphia.....	3½	8
Philadelphia.....	1½	8
New York.....	9	8

This table is a very unsatisfactory one, varying from 1½ to 9 horse-power per car for the same rate of speed, and the actual figures may vary considerably from these results, made up from hastily gathered data in part, and in part from statements of superintendents or engineers. It may be said that the lines in Chicago, St. Louis and Philadelphia traverse routes nearly level, while those in Kansas City, Cincinnati and New York have steep grades. At Kansas City, on the Ninth street line, there are portions of the route where grades are 15½, 16½ and even 18½ feet per 100. On the Vine street line, Cincinnati, 8 feet per 100, and on Tenth avenue, New York, 7 feet per 100. The horse-power per car seems to have a close relationship to the amount of business done upon the various lines. Chicago had at one time 330 cars upon the various lines. Kansas City Grand avenue line has, ordinarily, 30 cars running; St. Louis Citizens' line, 48 cars; Cincinnati Walnut Hill line, 40 cars; Philadelphia Seventh and Ninth, 60 cars; New York, 40 cars. It would seem from the above that the putting on of cars did not very much increase the required engine power, but had the effect only to decrease the horse-power per car. It is therefore probable that allowance enough has not been made for machinery friction and hauling the unloaded cable.

In some cities cars are warmed by stoves. This is true of the line at St. Louis. In others, as at Kansas City and New York, they are warmed by some chemical action, taking place in heaters placed beneath the seats. The objections to these methods, beside the room the stoves occupy, is that they warm the air which is in the car, and as soon as it becomes foul it is more objectionable than when cold. The best system we found in use, as it seemed to us, was at South Chicago, where a hole is cut in the floor of the car, beneath the seat on one side the center, and down through this is dropped a cast iron stove, the fire-pot hang-

ing below the floor while its top is flush with the same. It has a cover like a cook stove which can be lifted from within, and the fire can be replenished from a box of coal carried under the seat at the end of route or when the car has no passengers. The smoke pipe is a straight iron pipe, some three inches in diameter, running up just at edge of seat and through the roof. This pipe is protected by bars or netting, and it does not displace even one passenger. The casting about the stove is pierced with holes, so that heated fresh air rises into the car and displaces the foul. It furnished about the required amount of heat, as a car which carried six passengers showed a temperature of 55° when the outer air was at 20°.

Hewitt on Labor Tyranny.

At a dinner of the Williams College Alumni, Mr. Abram S. Hewitt is reported to have uttered the following sentiments:

We have very difficult problems in this age with which to grapple. They are not to be settled by declamation. I trust they will not be settled altogether by empiricism. We have new creative forces, powers which produce wealth beyond the wildest dreams of avarice. How are our problems to be solved—by the sword as in the past or by reason and reflection? Surely reason must prevail. We must discuss what are the rights of man, and what privileges will stand the test of reason. The fundamental doctrine, the underlying principle of the best institutions, of the noblest laws, is the right of the individual not only to control himself, but to manage his own property, the production of his own hand or his own mind, in his own way. This fundamental right is now in danger. It is in danger from the ignorant rich and the ignorant poor; and here lies the mission of the colleges, to train the mind that it may draw the line between right and wrong, to lay down the correct premises and come to just conclusions, to have the patience to investigate every phase of nature and of morals, and so reason out a system under which every class may have its rights and none may be deprived of its rights. What is all the tyranny of the past compared with the claim which is deliberately made in this country now, that it shall be in the power of one man—call him Powderly or call him Arthur or call him what you will—to paralyze the entire industry of the United States? Was there ever in the history of man a despot who laid claim to any such power as that? Where, at any time in the history of the race, has it happened that a conclave of 10 or 12 delegates should be sitting in a room, as there are to-night, to determine whether the bread and the fuel and the necessities of life should be withheld from those who are ready to work, and are working for the support of themselves and their families? Who is to stand up in this crisis and preach the truth? If the men who have been trained in college, in the mathematics, in the humanities, are cowards, and because they want votes are afraid to get up and preach the truth, then God save the republic, for man cannot do it. Hence I want the graduates of the colleges of the country to understand that they have a high mission, a greater one than Peter the Hermit thought he had when he led the hosts of the Crusaders to rescue the Holy Sepulchre. Ah, that is a sacred spot; but there is something more sacred than that. It is the right of men to govern themselves, to be their own masters, and not to be the slaves of irresponsible power sitting in secret and usurping the function of government. But I have not lost faith in the common sense of the people who for 100 years have maintained free government on this continent. Men who were willing to spend

\$6,000,000,000 to preserve the form, the fabric and machinery of free government ought to be ready and willing to sacrifice that amount twice over in order to preserve the substance and spirit and conscience of free government.

Improved Crank-Pin Machine.

Messrs. Pedrick & Ayer, of Philadelphia, Pa., have made some improvements in their crank-pin machine, which will, perhaps, be better understood from the annexed engraving. The tool is easy of access and readily adjusted. The wear can be taken up. It is lighter in weight and much easier to handle than the older form. It will quickly and accurately true up crank pins, taking off that part of the pin that is eccentric only and leave the fillets at the corners. It will feed either way and fit any size pin, and will go over the collar of a consolidated engine pin. For very small pins a collar is slipped into the circular cutter-head and tool fastened to it so it will not project far enough to spring. The end of the machine next to

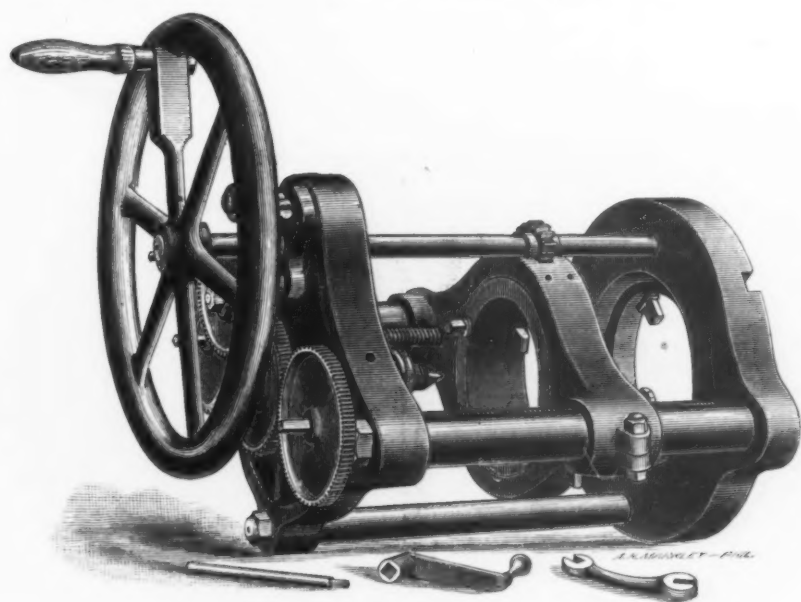
Australian Lead Mines.

The lead mines of Australia, according to the London *Statist*, are proving to be much more productive than had been anticipated. The output has steadily increased, and is just now increasing very rapidly, and the ore is found to be rich in silver, though, of course, not nearly so rich as the famous American mines. One of the great shipping companies was asked recently to contract for the conveyance from Australia to this country of no less than 600 tons a month of lead ore. The ore is found to contain roughly about $\frac{1}{4}$ of 1 per cent. of silver. In the quantity given above there would consequently be $4\frac{1}{2}$ tons a month, or 54 tons a year, of pure silver. The quantity is absolutely large, but relatively it is not large enough to have any material influence upon the silver market. Indeed, the best informed still continue of the opinion that the price of silver is likely to rise. Just now the recovery in prices generally has been checked by a fresh war scare; but that the upward movement begun in the autumn will be

by Mr. John L. Gill, Jr., on screw-threads, embodying, as it does, a critical review of the Whitworth, Sellers and other screw-threads, and a full account of a new form proposed by Mr. Gill on the basis of a series of tests made by him to show its superiority. Mr. Gill's thread is formed part square and part V. He found that a thread might be made in this way in which the altitude was not dependent upon the pitch of the thread, and that the altitude could be made in proportion to the diameter of the bolt. He discovered, too, that making the altitude $\frac{1}{160}$ inch high for each $\frac{1}{4}$ inch in diameter, would reduce the cross-section of the bolt uniformly 15.35 per cent. on all sizes, while the Sellers system reduces it 18 per cent. on a 6-inch bolt and 35 per cent. on a $\frac{1}{2}$ -inch bolt, with varying proportions on the intermediate sizes.

The Connellsville Coke Trade.

The situation in the coke industry at the present time, both as regards prices and demand, is decidedly gloomy. Since the first of the year the price of coke has been reduced 50 cents per ton, and yet in the face of this large reduction the demand is steadily growing less, and from present appearances an improvement is not looked for, and in all probability a further falling off in the demand will take place. The shipments for the month of February aggregated 18,500 cars, as against 20,225 in January and 25,200 in December. The shipments were distributed as follows: West of Pittsburgh, 10,500 cars; Pittsburgh and rivers, 3500; east of Pittsburgh, 4500. In January 13,600 cars were shipped west of Pittsburgh, 2500 east of Connellsville, and 4125 to Pittsburgh and rivers. These figures show a falling-off in total shipments of 1725 cars during the past month. A number of the largest works in the region are idle, while the balance are running four days in the week, remaining idle on Wednesday and Saturday. It is estimated at the present that out of the 12,468 ovens in the region fully 30 per cent. are idle and possibly more. The failure of the large operators to form a syndicate is causing a great deal of dissatisfaction, and will probably result in a war of prices which will prove disastrous to those interested. A meeting of the Coke Producers' Association, composed of the independent or small operators in that region, was held at Connellsville, on Monday, the 5th inst. At this meeting it was agreed to pursue an independent course in the future, the reason for this action being that the members of the old syndicate had refused to settle the claim for damages for the failure of the syndicate to keep the car contract of 1886. It is alleged that through the unequal division of cars the producers lost much valuable trade. An offer was made to the members of the old syndicate to accept \$25,000 in settlement of this claim, which was refused, and it is now stated that suit will be entered to recover the full amount, which is about \$60,000. While the price of coke is given out as \$1.50 per ton, it is known that some of the independent operators have made sales in the West recently at figures considerably below this price, and it can be truthfully said that just now there is no fixed price for coke, as each operator, large or small, is endeavoring to dispose of his coke at the best figure he can get. At the time the last reduction in the price of coke was made, the employees in the region were notified that a 10 per cent. reduction in wages would also be made. This was refused, but at a meeting held on Wednesday, the 7th inst., it was decided by the workers to submit to a reduction of $6\frac{1}{4}$ per cent. This has been accepted by the operators, and a strike has been averted, for the present at least.



CRANK PIN MACHINE, BUILT BY MESSRS. PEDRICK & AYER, PHILADELPHIA, PA.

the driver contains a four-jawed scroll chuck, with thin jaws that center that end of the machine. At the opposite end there is a center that slides into the center of the pin. The machine is then mounted by the original centers and is clamped in position by bolts passing through the spokes of the driver. The annular cutter-head containing the tools is driven by a small pinion, hand-wheel and shaft. From this shaft, by gearing, an automatic feed is secured either way. The carriage containing the cutter-head is given an even, smooth travel by two feed screws.

The statements of Mr. Andrew Carnegie give interest to the following. A comparison of the production in ingots and rails industries between Pittsburgh and Chicago:

	Net tons. Ingots.	Net tons. Rails.
Allegheny County.....	580,937	321,663
Cook County.....	594,781	492,066
	Gross tons. Ingots.	Gross tons. Rails.
Allegheny County.....	518,694	287,190
Cook County.....	531,055	439,345

These figures do not include the product at the Joliet works, which are in Will County. This would add a little more than 200,000 tons more to the Chicago district, making the product much beyond all kinds of steel made in Allegheny County.

resumed is the best opinion, and that with the recovery in the produce markets there will be some recovery in the silver market is also thought to be exceedingly probable. But while the influence of the Australian mines upon the silver market is not expected to be so large as to counteract the general tendency toward better prices, it is thought extremely likely that those mines will materially affect the lead market. In the first place the ore, it will be seen, is rich in silver. It contains about $\frac{1}{4}$ of 1 per cent. of that metal, whereas the produce of our English lead mines contains on an average about 0.03 of silver. Consequently it is extremely probable, if the Australian mines prove to be as productive as they are now believed to be, that the working of the English mines and others equally poor in silver, will have to be stopped; for, although the proportion of silver in Australian ore is so small relatively to the lead, it is still of greater market value. This circumstance is likewise likely to have an influence on the price of lead, for since the silver is commercially more valuable than the lead, the mines could be profitably worked in Australia, even though the price of lead were to fall very considerably.

The March number of the *Journal of the Franklin Institute*, of Philadelphia, contains a particularly interesting paper

The Panama Canal Locks.

Le Génie Civil describes and illustrates in detail the locks which have been designed for the Panama Canal by the well-known French engineer, M. Eiffel. The gates, according to this design, are movable, balanced caissons, supported on hangers which roll on a track carried above the level of the canal by a swinging truss. Each gate may thus be rolled, in a direction at right angles to the line of the canal, into a chamber specially provided for it in the bank of the canal, an overhead rail in this forming a continuation of the swinging truss rail just mentioned. The whole arrangement is practically similar to that adopted in connection with sliding barn, workshop and drawing-room doors so familiar to everybody. The swinging truss is pivoted on the bank opposite that fitted with the chamber which holds the gate, and can thus be swung entirely out of the way. The rollers of the gate are so arranged that the latter may move transversely to its ordinary path to a slight extent, the design being to secure a certain amount of clearance between the gate and the walls of its receiving chamber so as to avoid excessive friction. The height of each gate at the lower ends of the locks is about 69 feet, its width 71 feet, and its thickness $13\frac{1}{4}$ feet; at the upper ends the dimensions are respectively 33, 71 and 10 feet. This, it will be observed, provides for a difference of level of about 36 feet for each lock.

At one of the meetings of the German Society of Engineers of the Lenne district, Herr Baedeker delivered an address embodying the results of a series of experiments to test the accuracy of the opinion held by wire drawers that wrought iron is least affected by excessive pickling, mild steel a little more and hard steel considerably more. At the same time he undertook to investigate the question whether sulphuric acid and hydrochloric acid acted in a different way—that is to say, whether either of these acids pickle more readily than the other. The test was carried out by using as a basis for comparison the number of bendings which a wire would resist without breaking after the different treatment it had received. The result was that wrought iron and mild steel are attacked about the same way, while hard steel suffers more, and that there is very little difference between the action of sulphuric and hydrochloric acid, the drawback with the latter being that the fumes are more troublesome to the workers. It was ascertained that a short period of pickling suffices to considerably affect the ductility of hard steel. It is a well-known fact that wire over-pickled becomes fit for use again when allowed to lie in a dry spot for a considerable length of time, and that annealing may be used to remove the objectionable influences of pickling. Both these methods are not, of course, applicable in ordinary practice, and, therefore, another method was studied. Mr. Baedeker found that moderate warming for a fair length of time brings back the quality of the wire to its ordinary standard, and, as most wire is dipped into milk of lime and is then dried, the heating required can easily be carried out in drying ovens.

H. Rémaury, in a series of articles on the copper production of the world, printed in *Le Génie Civil*, refers to the famous Boleo copper mines of Lower California,

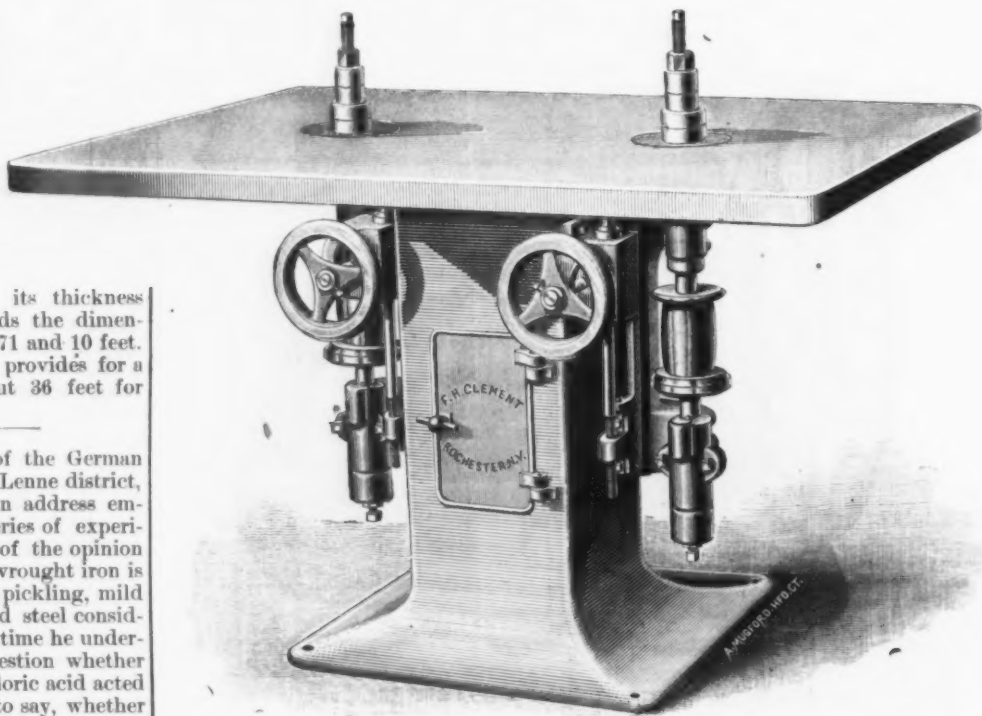
Mexico, in which French capital has taken so great an interest during the past few years. He quotes a number of analyses made at the Paris School of Mines, which show the metallic copper contents of the ore to vary between 12 to nearly 22 per cent. While these analyses are, of course, from picked samples, their interest lies particularly in proving that the ore carries neither arsenic nor antimony. Famous French engineers have estimated the quantity of ore in sight at about 3,000,000 tons. In 1887 the run of mine ore smelted in the works of the company ran a little over 5 per cent.

New Variety Molder and Shaper.

In the annexed engraving we show a new upright molder or friezer, just brought out by Frank H. Clement, 222 Mill street Rochester, N. Y. This machine, we understand, is extra heavy, well designed and carefully fitted. Great pains have been

abandonment of contracts awarded, one for 10 engines recently received at the Grant Works having gone to the next lowest bidder, the Rogers Works, where it is now being executed. There are a number of elevated engines in hand at the Grant Works, but little else is being done. The men who have been discharged understood that it was not a merely temporary lay-off, such as sometimes occurs in a certain department even in quite busy times, but a permanent dismissal, so that they applied for and, as a rule, obtained work at the other shops. The cause of the permanent suspension, if it amounts to that, is said to be very simple, the works having been run at a loss for a long time past and the company not caring to lose any more money.—*Paterson Guardian*.

Admiral Fremantle of the British Navy made the statement in a recent paper that the best way to test a modern ship is to send her to sea and let her go her best for say



NEW VARIETY MOLDER AND SHAPER, BUILT BY F. H. CLEMENT, ROCHESTER, N. Y.

taken with all the working parts to prevent lost motion, heating of the journals and vibration of the spindles. Long bearings are provided for the spindles, the upper one being close to the top of the table; the boxes are self-oiling and protected from dust; large table surface is provided, and also convenient and sure means of adjusting the spindles vertically. There are large openings in the table around the spindles, into which rings are fitted for various sizes of collars. The spindles can be made entire or with independent top sections, as wanted. The table may be of wood or iron, and collars of any diameter up to 4 or 5 inches may be run on the spindles. Eight collars, we are informed, are usually supplied with the machine.

It is rumored that the Grant Locomotive Company is going out of the business altogether, and many things that have occurred of late seem to corroborate the statement. Among the most notable of these is the fact that men have been discharged from time to time for some weeks past, until a large portion of the working force has gone and the establishment is in but partial operation. Then there has been an

1000 miles. This will show what she is good for in all weathers as to speed, how she minas her helm in a beam, quartering, fair and head wind, the length of time her bunkers are capable of supplying her with coal and the distance she can get over without recoaling. Such cruises would, of course, run up large coal bills, but, as he says, they would pay in the end, because furnishing reliable data of what can really be expected from each individual ship. Admiral Fremantle thus simply voices a sentiment which has for some time been gaining ground, and which can no longer be disregarded by naval authorities.

In a letter to the Collector of Customs, of New York, dated the 1st, the Treasury Department announces that Decision 8489, of October 21, 1887, concerning the classification under the existing tariff act of charcoal-iron bar ends, has been reconsidered, and, by the advice of the U. S. Attorney-General, it has been held that, as such bar ends have not been in actual use within the meaning of that term as contained in Schedule C (T. I. 145), they are dutiable at the rate of \$22 per ton, under the further provision in said schedule, T. I., 148.

A New Surface Grinder.

We illustrate on this page a new form of surface grinder made by the Tanite Company, of Stroudsburg, Pa. The machine is so simple that we need give little description, the principal features being, moreover, well shown in our engraving.

The Tanite Company were among the earliest promoters of this style of grinder and their large machine, for locomotive work, is in wide and successful use. In the present case the company have simply added a surfacing attachment to the frame in order to adapt the surfacing process

balance and topple. As a matter of fact, the Whitworth plan was that in accurate grinding the emery wheel should not project. As another matter of fact, in first-class shops, like that of the Pennsylvania Railroad Company, at Altoona, Pa., surfacing machines of large size are used on cross-head guides, cross-head keys, rod keys, grease-box tops, &c., with the wheel projecting, and although absolute accuracy of the Whitworth stamp may not be secured, yet ordinary mechanics have become so expert in grinding that they attain practical accuracy, even on cross-head guides. If cast iron can be ground at a cost of 18-10

shippers to take advantage of the carriers rather than a contrivance of the transportation companies to secure business from competitors. The inspectors cannot examine all shipments, and, I would recommend that the transportation companies themselves require the weighing of cars and the closest inspection of freights to prevent overweights and fraudulent classification."

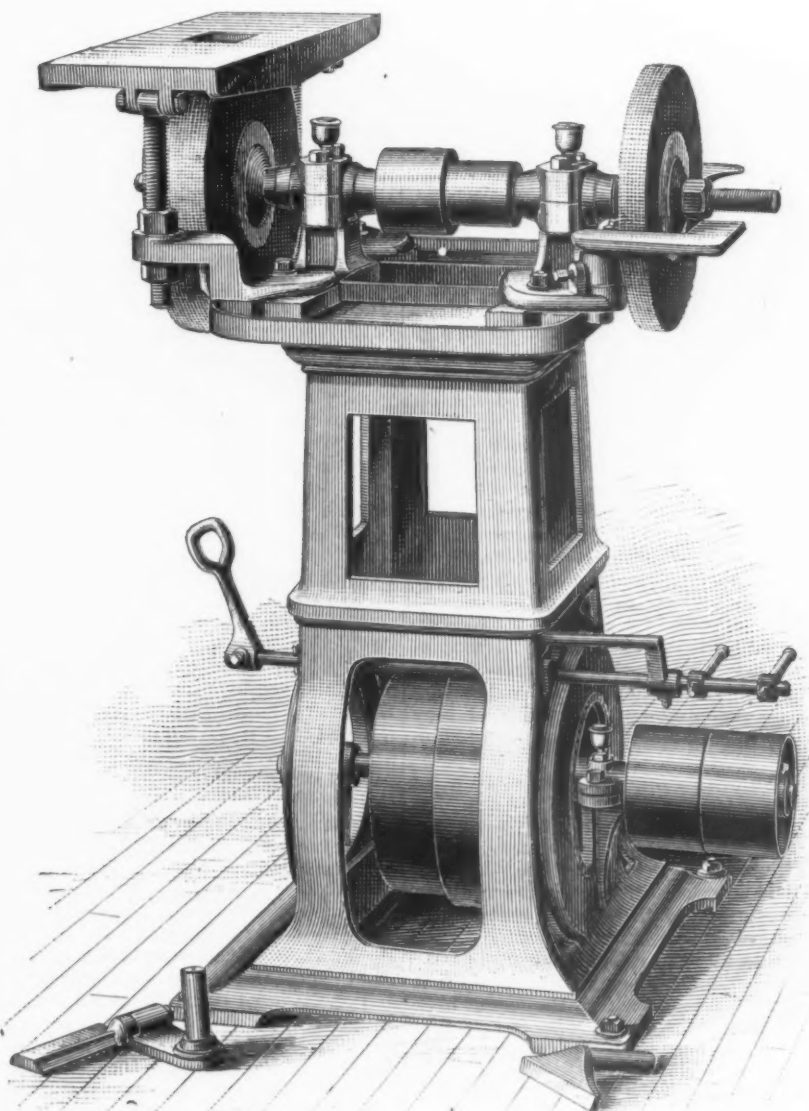
Council for the Chicago, Burlington and Quincy Railroad, on the 8th inst., filed a petition in the United States Court setting forth the history of the strike and praying for an injunction against Chief Arthur and the engineers' brotherhood, as well as an order on the Wabash Road compelling it to handle Burlington freight in discharge of its duty as a common carrier. The order issued by the court covers the ground of the bill. The Press Committee of the strikers, authorized to speak for Chief Arthur, said an injunction against Mr. Arthur would not be worth the paper it is printed on, because he does not order men to quit work. An injunction against the brotherhood, it was said, is equally worthless, because it is not an incorporated body, and that, if the engineers on the Wabash road do not want to handle Burlington freight, no court can make them do it. The striking engineers issued a card to the public, in which they say that the two organizations engaged in the present trouble are composed of conservative men, and are ready and willing now, and have been, to meet the officers of the company and arbitrate the question in dispute. They are not only willing to do this through their executive officers, but are also willing to place the whole matter in the hands of three railroad managers, and abide by their decision.

Work on the Standard Oil Company's pipe line from the oil fields in Lima, Ohio, has commenced, and large quantities of pipe have been received from the Eastern contractors for distribution along the line. The saving from freight charges imposed by the Interstate law is expected to reimburse the company for this heavy expenditure. The capacity of the line will be about 25,000 barrels a day. The oil will be forced through the line by heavy pumping engines at intermediate points. A pipe line to New York to cost \$2,000,000 will be built when the Chicago line is finished.

The Pekin Government has granted to a British Company permission to navigate the river Yangtze 500 miles inland beyond the present limit, which is about 1,000 miles from the ocean, thus making accessible the commercial city of Sze-chuen, the capital city of a province containing a population greater than that of the entire United States. The United States Minister at Pekin has informed the Department of State that the ports of China at which foreigners have the right to reside, to procure property and to do business are as follows: Shanghai, Newchwang, Tientsin, Cheefoo, Ickang, Hankow, Kiu-kiang, Wukee, Chinkiang, Ningpo, Wenchow, Foochow, Yamsin, Takow, Amoy, Swatow, Canton, Kiungchow and Pakkoi.

Melbourne papers of January 13 speak of a buoyant feeling in business circles, mainly due to the successful placing in London of the third installment of the \$40,000,000 loan authorized by the Government in 1885. Labor was much better employed.

One of the most important railroad projects recently outlined in the far West is the extension northward of the Nevada Central Railroad to the Union Pacific through a wheat-growing region.



NEW SURFACE GRINDER, MADE BY THE TANITE CO., STROUDSBURG, PA.

for ordinary shop use. While surfacing machines are simple, their use is not, and considerable confusion of ideas has been the result. Sir Joseph Whitworth is credited with the origin of this system, his idea being to use the surface as a perfecting machine—to grind little, but that exactly. His plan was to mount the solid emery wheel in such a manner that its cutting face was in the same plane as that of the table top. The convexities of the metal being ground were thus removed and its face became as accurate as that of the table on which it rested. Misunderstanding this, a mechanical writer, some years ago, published in one of the American scientific journals an elaborate illustrated paper to prove that correct grinding could not be done on such a machine, his theory being that as the face of the emery wheel projected through the table the piece of work being ground would at some time

cents per pound, as against 25-10 cents per pound for the filing process, or if anything like such a disproportion exists, then the use of solid emery wheels cannot be too quickly or greatly increased, and every machine which furnishes means of applying a grinding wheel under special relations should be welcomed as a friend in the machine shop.

A smaller grinder than that shown but of the same general design is also built by the Tanite Company.

In a letter to the Executive Committee of the Southern Railway and Steamship Association, Mr. T. M. R. Talcot, commissioner, says: "The weighing of freight and inspection of classification have demonstrated that underbilling is so generally practiced as to make it no longer to the interest of any line to permit it; indeed, it seems to be an effort of the

Leather Link Belting.

We have just received from Messrs. Chas. A. Schieren & Co., of 47 Ferry street, New York, a specimen of their leather link belting, which, within the past few months, has gained considerable favor.

Leather link belting was unknown in this country previous to 1885, and although it had been in use in England and France for 25 years previous, it seemed unsuited to our swift running machinery. Mr. Chas. A. Schieren went abroad several times, visited the leading manufacturing districts of Great Britain and the Continent, studied the manufacture of these leather link belts, and resolved to introduce them into this country. He endeavored to improve these belts and make them suitable to be run on our machines; and in order to do this had several of them made and tested in his own extensive factories. He found that with a few necessary improvements they could be made to do excellent work on our American machinery. Many valuable improvements were invented by him, such as the American Patent Joint. This joint gives the belt an unbroken, flat surface, and just pliability enough to conform itself to the rounded face of a pulley.

Two bolts are used for each width of belt, allowing the belt to adjust itself to any pulley, whether flat, crowned or cone. The English use only one bolt for each width of belt. By this method the bolts must bend to the rounded face of the pulley before perfect contact can be secured, and in many cases the bolts refuse to bend and therefore break off. Since the introduction of the joint link belts have been run on all kinds of machinery with great success. They have, moreover, decided advantages over ordinary belting. Every foot of belt is of exactly the same weight; the belt, therefore, runs smoothly. They are claimed to be much more pliable than ordinary belts, to be more easily adjusted to the pulleys, to save cost of lacing, belt hooks, &c., and to stand more strain and last longer than two ordinary belts. During a recent visit to the works of the Thompson-Houston Electric Company, at West Lynn, Mass., we saw several of the belts in use driving dynamos. Messrs. Schieren & Co. are the sole agents for the sale of this belting.

The "Tin King" on the Situation.

At the meeting of the stockholders of the Carn Brea, a Cornish tin mine, Arthur Strauss, frequently known as the "Tin King," made the following remarks on the situation of that metal:

When I last had the pleasure of addressing a Cornish audience about tin, I believe it was at Camborne, I stated that a price of £100 or £110 or £120 had a most disastrous effect on foreign supplies. I then proved by figures—I believe it was at the end of October last—that there was abroad a sign of an increase of not less than 50 per cent. from the supplies from the Straits. And I warned gentlemen—and my remarks were almost as much directed to the people who were gambling in tin then as it was to the Cornish community—I warned them that even a price of £110 and £120 was increasing the foreign supplies to an alarming extent. Since then the price has gone to £160 and £165. What do you see now? The increase from August last, from the time when there was general confidence placed in the high price of tin, the increase of Straits tin has not been less in these six or seven months, compared with the corresponding period of last year, than 80 per cent. Instead of having, roughly speaking, about 10,000 tons from the Straits in the seven months, we have during the past seven months re-

ceived a supply of 18,000 tons. That will show you what the inflated price of £165 has done in the Straits. Now, what effect had it on consumption? This price—above £140—commenced about three months ago. There has been a decrease since then in the general consumption of more than 20 per cent., and our deliveries are going on in a very slow and unsatisfactory manner. You therefore come to this, that the increase in the price of tin has brought us a sufficient addition from the Straits that will almost supply the whole consumption of tin in the world as regards foreign tin.

You have now the visible supply of tin of 20,000 tons against the total visible supply six months ago of 10,000 tons. There is every reason to believe, if this price continues, that this additional supply will go on, and that in six months' time you will have 30,000 tons, in another six months 40,000 tons and so on *ad infinitum*. This is a very uncomfortable state of affairs, because the longer this high price lasts, the more our supplies accumulate, the longer it will take when the time of depression comes—as it is sure to come—the longer it will take in the remedy; and the depression will be all the deeper,—the reaction will be all the deeper—if we have to pass much longer through such an inflated time as now. I have frequently stated that a price of £100 per ton, if continued for a long time, would be best for the Cornish community. I am still of the same opinion. It is much to be regretted that the price of tin ever went above £100, although, no doubt, many gentlemen here may have made large profits by its going above that. But I speak for the general welfare of the community. It would have been better if the price had lasted for a number of years at £100 than to go to £160, and so have increased the supplies to such an extent that they have become overwhelming, while consumption has been greatly put a stop to. When once you have increased your production through the higher prices, it is difficult to stop the production.

If the price comes to £140 or £120, or even £80, you will not quickly stop that overproduction which is taking place in the Straits. Every step has been taken there for increasing the production. It will take a long time before you increase that consumption. In the case of a great number of industries where tin was formerly used, they have taken to other materials, and have probably found them to answer, and it may be a long time before they come back again to tin. We must come to this, that it is quite impossible with the enormous increase we have from the Straits, with the enormous additions to our figures, with the most important decrease in our consumption, that the present price of £160, or anything like it, can last forever. I suppose you are all aware that the reason why the price has gone up is that a very powerful French syndicate has pushed the price—I think has pushed it on bad information which they received at first. I still believe that if the gentlemen who form that syndicate had been told before they started this rise what would likely become of it—that the stock would increase in such a rapid proportion as it has increased, that the supplies would increase so rapidly as they have done to such a large extent—I still believe they would not have pushed the price. And, mind you, I always go from the standpoint that this rise in price has done, and will do in the future, an enormous amount of harm to this county on account of the very deep depression through which you will have to go later on. It is in everybody's mind how long these prices are likely to last. I think that depends not on anybody here; it depends on the whim of certain gentlemen across the water. They have to fight nature, and of course they will be beaten in the end.

But there is no doubt that the leader of this move is a man of immense resources—both resources of mind, and, what is perhaps more important, resources of money. He is a gentleman who has always shown himself to be very clever, very versatile in commercial affairs, and who is shown to have a large amount of endurance and patience. Therefore, no doubt he would have given up the disastrous game he is playing at present long ago if other circumstances, of which we have no knowledge, did not induce him to keep up the price, even at the heavy monetary sacrifice he is making to keep the price where it is. Now that the mischief has been done, I hope and wish he will keep it there for a much longer time. All the evil that can possibly be created by the high price has been created, and let us only hope there is money enough there, power and endurance enough there, to keep the price where it is for another few years. It would be very satisfactory. I am afraid it would be very difficult to keep it for any great length of time, but we are all thankful for small mercies. If we cannot have it for years, let us have it for months; if not for months, for weeks. But let us prepare for the depression which is sure to come when these prices cease to be given. Some remarks have been made about my having spoken against tin some time ago, and seeming in favor of it now. You can gather how much I am in favor of the present price from what I have said. But I do say this, that when the price of foreign tin was £165, and had been kept there for a very long time, the price of English, which generally is above the price of foreign, was £145, and it seemed to me that there was no sufficient reason for English tin being £20 below the price of foreign tin, and I was under the impression that with a little boldness, a little sacrificing, and a little courage, by paying high prices for ores, this abnormal state of affairs might be remedied, and that English tin might equal foreign tin while it lasted at the present high rate. I am happy to say my efforts, which were backed up by the other smelters with all their power, have proved successful, and that the price of English tin is much nearer the price of foreign tin than it was some time ago.

The Atlantic terminus of the Canadian Pacific Railroad has at last been definitely fixed, according to present appearances, and the favored port is St. Andrews, New Brunswick, on the Canadian side of the St. Croix River, and about one mile distant from American soil. The harbor is safe and commodious, protected by natural sea walls. Lately numerous important land transactions have taken place at that locality, in which Canadian officials have acted a leading part. Railroad circles in Maine are surprised to learn that a charter granted for a railway from the Canadian line, 125 miles across the State to a point on the Maine Central, really forms a part of the Canadian Pacific scheme for reaching tidewater at St. Andrews.

The rapid and substantial recovery of British trade from long continued depression was noticed by Sir Bernhard Samuelson, M. P., at the recent session of delegates from Chambers of Commerce in the United Kingdom, by referring to a remarkable increase of exports of produce and manufactures during the year 1887. The total in round numbers was 9,000,000 pounds sterling greater than in the previous year.

Fully 300,000,000 feet of spruce timber from New Hampshire and Vermont will be floated down the Connecticut River this spring.

MANUFACTURING.

Iron and Steel.

The rolling mill of the Kittanning Iron Company, Limited, at Kittanning, Pa., has been closed down for an indefinite period. The product of this plant was muck iron exclusively, the greater part of which was sold to Graff, Bennett & Co., at Pittsburgh, who recently made an assignment. Rebecca Furnace, also operated by the first-named firm, was blown out on Saturday, the 3d inst., for relining and other repairs, which have already been commenced. When these are completed the furnace will probably resume operations.

The Cincinnati Forge and Iron Company, of Cincinnati, have concluded to rebuild their works, which were destroyed by fire on Thanksgiving Day. They have perfected arrangements for constructing them on a larger scale, but will occupy the old site. In about six weeks they expect to be ready to turn out car axles and shaped work, including their favorably known "special" passenger axle.

Benwood Furnace, of the Benwood Iron Works, at Martins Ferry, Ohio, was blown out on Wednesday, the 7th inst., for the purpose of being relined and repaired.

Among the recent heavy transactions in the Cleveland real estate business may be mentioned the purchase by the King Iron and Bridge Company of 9 acres of land on the lake shore, a short distance east of Madison avenue. Work has already been begun upon shop buildings, which, when finished, will cover a greater portion of the land mentioned. The works of the company will then be removed to the new quarters, when the firm's present capacity will be about trebled. It is the intention of the King Iron and Bridge Company to increase their resources enough to admit of their bidding upon everything in their line that comes along. The plant will represent a value of about \$1,000,000. The Pennsylvania Company will build two or three switches to the new works; the Lake Shore Company have several side tracks already laid upon the ground.—*Trade Review.*

Reeves Bros., of Niles, Ohio, boiler manufacturers, are running full, with orders on hand to run them until August 1, principally on upright and return tubular boilers. They are building four large stills for the Eclipse Coal Company, of Franklin, Pa., each 15 inches diameter and 50 feet long.

In answer to a report that the Hubbard Iron Company, of Hubbard, Ohio, were about to drill for natural gas on their property at the above-named place we are informed that they are drilling an 8-inch hole for water only and do not expect to get gas. The hole will be drilled about 200 feet deep.

The Isabella Furnace Company, of Etna, Pa., under date of the 6th inst., inform us that there is no truth in the report that one of their stacks would shortly be blown out for repairs and the other would be banked up, on account of the large stock of pig iron on hand. Both furnaces are in successful operation and working to their full capacity, making about 200 tons each daily.

The puddling department of the Coatesville Iron Works, at Coatesville, Pa., which has been closed down for several weeks, resumed operations on Monday, the 5th inst.

Steubenville Furnace, at Steubenville, Ohio, owned by the Riverside Iron Works, of Wheeling, W. Va., which has been idle for some time, undergoing repairs, will resume operations in a few days.

The Sloss Iron and Steel Company, of Birmingham, Ala., have awarded the contract for remodeling the Sloss Furnace No. 1 to Messrs. Gordon, Strobel, & Lau-

reau, of Philadelphia. The work is to begin at once. The capacity of the furnace will be largely increased.

J. W. Hoffman, of Philadelphia, who is now the general manager of the Chattanooga Iron Company, Walker Iron and Coal Company, and Dade Coal Company, has placed Mr. C. B. Finley, late manager of the Kittanning Coal Company, in charge of the coal mines, and Mr. J. W. Higgs, late of the Isabella Furnaces, at Pittsburgh, in charge of the furnaces of the first two companies mentioned above.

P. H. Miller, assignee of the firm of Graff, Bennett & Co., at Pittsburgh, states that there is no possibility of the various plants of the firm resuming operations for some time to come. Clinton Furnace, at Pittsburgh, and the Grafton Furnace, at Leetonia, Ohio, owned by the firm, will continue in operation until the material on hand is all worked up, when they will be blown out. It is expected that a meeting of the creditors of the firm will be held in a short time, probably at Pittsburgh.

The Viaduct Iron Works, at Coatesville, Pa., manufacturers of boiler plate and flue iron, have started up after an idleness of four months.

Emma Furnace of the Cleveland Rolling Mill Company, at Cleveland, Ohio, was put in blast on the 23d ult., after a stop of about two months for repairs. The annual capacity of the furnace is 40,000 gross tons of the best grades of mill and foundry iron, the greater part of which is consumed by the company in their rolling mill.

Keystone Furnace No. 2, of the E. & G. Brooke Iron Company, Limited, at Birdsboro, Pa., is being relined and repaired and will be put in blast early next month.

The McNeil Boiler Company, of Akron, Ohio, have been incorporated, with a capital stock of \$50,000, and will manufacture steam and heating boilers, car tanks, and a special line of machinery for paper mills.

The big gun recently cast at the works of the Pittsburgh Steel Casting Company, at Pittsburgh, was taken from the annealing furnace on the morning of the 4th inst., and found it to be in excellent condition. It was put into the furnace on February 24th, and gradually heated up to 1400° F. Then it was slowly cooled and hardened, again raised to 1400°, and, after being allowed to remain at that temperature for a time, finally withdrawn from the furnace. Superintendent Hainsworth has expressed himself as being perfectly satisfied with the results so far, and expects to have the gun ready to ship by the 20th inst. The final test will take place at Annapolis, and if it proves successful Mr. Hainsworth is ready to begin the casting of a gun 111 tons, as large as any ever cast.

The Cleveland Rolling Mill Company, of Cleveland, Ohio, have received an order for 7000 tons of steel rails from the New York, Pennsylvania and Ohio Railroad Company.

A certificate of incorporation was filed with the Secretary of State of Ohio, week before last, by the Beecher Furnace Company, of Cleveland, capital stock \$50,000, the incorporators being William F. Beecher, Theodore H. Cahoon, William H. Beecher, Robert H. West and Clifton D. Ellis.

The Carbon Iron Company, of New York, have contracted with Messrs. Lean & Blair, of Pittsburgh, for the erection of an open-hearth steel plant, at Thirty-second street, that city, to consist of two Lash patent steel melting furnaces of 15 tons capacity each per heat, with all the necessary hydraulic machinery, buildings, &c., the entire plant to be in operation in 120

days from date. Work will be commenced at once. Messrs. Lean & Blair are building a 20-ton furnace of this type for the Standard Steel Casting Company, at Thurlow, Pa., which will be used for heavy ordnance, &c., and will be the largest open-hearth furnace for this class of work in the world.

The Troy Steel Rail Mill, Troy, N. Y., has been doing some good work lately. Some time since 526 tons were rolled in one day, the best record thus far for these works.

A fly-wheel at the Fishback Rolling Mill, of the Pottsville Iron and Steel Company, burst on Thursday, causing serious damage to machinery and the building by the flying fragments. Press reports state that the engine was running at a speed of 100 revolutions per minute, the ordinary rate being 80. The master mechanic warned the men to slack the speed and one of them was just putting his hand on the steam wheel to do so when the crash came.

A jury which has been sitting at intervals for months to decide a question of damages claimed by the Pottsville Iron and Steel Company, Pottsville Pa., by reason of the Pennsylvania Schuylkill Valley Road crossing the island on which the Pioneer furnaces are built, on the 7th inst. rendered their verdict. The iron and steel company claimed \$150,000 damages, based on interference with their furnace plant and the connections between this and the rolling mill and steel works owned by the same company at the other end of town. The jury gave an award of \$25,950, this being the compromise offered by the railroad company, with interest added.

Machinery.

A reduction of 226 men at the car and machine shops at Fort Wayne, Ind., was made by the Pennsylvania Company on the 5th inst., on account of very great falling off of freight business. The machine shops have worked night and day since last fall. Night work has, of course, been suspended. Another reduction is anticipated. Miles of empty cars are being stored on the line.

The Reliance Gauge Company, of Cleveland, Ohio, recently received their fourth order from the Pencoyd Iron Works, of Philadelphia, for safety water columns of the combined high and low water alarm pattern.

On Wednesday, the 8th inst., 50 men were laid off for an indefinite period at the shops of the Pittsburgh, Cincinnati and St. Louis Railway, at Logansport, Ind. Scarcity of work and a desire to cut expenses rendered the suspension necessary.

The Westinghouse Electric Company, of Pittsburgh, have just completed an incandescent lamp, which is expected to give better results than any lamp now in use. It is said the new lamp will burn easily from 2500 to 3000 hours, while 800 hours was considered a long time for the old style of lamps. The above company have received notice from the local gas company at New Bedford, Mass., that they have been awarded a contract to furnish that city with a 2000-light plant, work on which will begin at once.

The S. Obermayer Foundry Facings and Supply Company, Cincinnati, are having placed in their works two new steel tubular boilers, 72 inches diameter and 18 feet long, and report every department as running to its fullest capacity.

The Laidlaw & Dunn Company, Cincinnati, have been awarded the contract to supply two 7 x 28 feet Galloway boilers of 300 horse-power each, and the pumps to supply same, for the electric lighting department in Washington Park, where the

new building of the Ohio Valley Centennial Exposition has been erected. These boilers seem to have been given the preference from the fact that they were specified by the executive officers of the following exhibitions: Vienna, 1873, two boilers; Philadelphia, 1876, three boilers; Paris, 1878, three boilers; Health, 1884, two boilers; Inventions, 1885, seven boilers; Colonial, 1886, four boilers; Liverpool, 1886, three boilers; Jubilee, 1887, ten boilers—in every instance receiving the highest award.

The Bucyrus Foundry and Mfg. Company, of Bucyrus, Ohio, shipped on the 29th ult. the largest and most powerful steam shovel ever built in this country to the Lake Shore and Michigan Southern Railroad Company for use in digging shale rock at Ashtabula, on the line of their road, which it is expected to do without blasting. This machine is the first of two for which they have orders from the same road. It has a capacity of from 4000 to 5000 cubic yards per day in ordinary material, and will handle a three-yard bucket. They have a large number of other orders for steam shovels, dredges, derricks and other machinery. They are also building a very large and powerful dredge for the United States Government and another for the Commissioners of the South Park, Chicago.

The Secretary of the Navy has awarded contracts for furnishing tools for the Navy Yard, New York, as follows: Robert Wetherill & Co., a vertical condensing engine, at \$9700; S. C. Forsaith Machine Company, a punching and shearing machine, at \$2350; a punching machine at \$4600, and a plate-straightening machine at \$2156; Fraser & Archer, shafting, at \$516, and R. A. Robbins, a milling machine, at \$989.

We are in receipt of a neat circular relating to the Monogram blowers and exhausting fans made by B. F. Sturtevant, of Boston, Mass. The blowers are made expressly for blowing forge and boiler fires, puddling furnaces, &c., for which purpose they have been extensively introduced. The exhausting fans, on the other hand, are employed for removing dust from polishing and buffing wheels of all descriptions, smoke from forges, gases from rooms, &c.

Referring to the wire-cutting machine for dynamo brushes, mentioned by us last week, Messrs. John Adt & Son, of New Haven, Conn., the builders, write us that the machine in question was one of their regular automatic wire cutters, made with special care in regard to the working parts, so as to adapt it to the fine, soft copper wire that it had to work. All the parts were made light and delicate, to allow of the finest adjustment. No. 21 copper wire was taken from the coil and automatically straightened, cut in lengths of 12 inches and less and the cut pieces delivered from the machine, the whole work being done accurately and with rapidity.

The Hill Clutch Works, of Cleveland, Ohio, are now making one of the largest and most powerful friction clutches ever turned out, for a hoist in a coal mine in Pennsylvania, being only second to their B couplings, made for a Western street railway, and which weighed about seven tons each and were capable of transmitting 1500 horse-power at 100 turns. The present clutch will be of their A pattern and will measure 72 inches in diameter. It will have six arms instead of four, giving great power for small diameter, which is very important when it is desired to use a clutch on a hoisting drum or on a pulley of very wide face. The company inform us that they have recently received from the American Institute Fair Association a bronze medal, the highest award granted for friction clutches.

The Buckeye Engine Company, of Salem, Ohio, have brought out a new catalogue, marked Part Second, to distinguish it from the already existing well-known pamphlet in which their engine is illustrated and described. The new publication is devoted to "The Indicator, Its Use and Management," and contains in addition useful data on steam and steam-power plants. Altogether it embraces 88 pages, full of matter of interest and prime importance to steam engine attendants. The subjects are presented in a readily intelligible manner, and the treatment introduces no complicated formulæ or higher mathematics so dreaded by the practical man.

Hardware.

At the second sale of the Remington Armory, ordered by the Supreme Court, the works were sold, 7th inst., to Hartley & Graham, of New York, for \$200,000. The principal bidders were the Warner Miller and the Utica syndicates. Hartley & Graham will run the works, and intend to replace old machinery. Report says there is a feeling of satisfaction among creditors over the result of the sale. The first sale was to the same firm at \$152,500.

The Rockford Cutlery Company, of Rockford, Ill., are packing up and making preparations to remove to Keokuk, Iowa.

A license of incorporation under the laws of Illinois has been granted to the Brown Disk, Wheel and Axle Company, of Chicago; capital, \$1,250,000; incorporators, John N. Abbott, Benjamin Thomas and Alfred Post. Also to the Chicago Gun and Cutlery Company; capital, \$10,000; incorporators, W. H. Swift, David Campbell and E. W. Hills.

The Fred. J. Meyers Mfg. Company, Covington, Ky., report large sales of their Hunter flour sifters. A brisk demand has also been created for their galvanized wire fish traps. These traps are especially adapted to gentlemen's fish ponds or small lakes, and can also be used as fish boxes to keep fish alive in after they are caught.

The Sterling Mfg. Company, of Cuyahoga Falls, Ohio, chain manufacturers, are reported to have made an assignment on the 6th inst. The failure was precipitated by a writ of attachment for \$1975, served on behalf of Turner, Vaughn & Taylor, also of that place. The company employed about 40 men.

The Gibbs Lawn Rake Company, Canton, Ohio, will, on account of inadequate capacity and manufacturing facilities, begin the erection of a large brick structure at an early date, which will insure them more than double their present output. They will also add several new specialties, chief among which will be a new form of lawn rake, embodying a number of special features and improvements.

The A. W. Coates Horse Hay-Rake Manufactory, at Alliance, Ohio, which has been in the hands of a receiver for a number of years past, has again been turned over to Mr. Coates, and it is expected that the works will be put in operation at an early date. Thomas W. McIlvain, of Pittsburgh, has become associated with the firm.

Hunter & Smith, Delaware, Ohio, advise us that the outlook for 1888 with them is very encouraging, they receiving more orders and inquiries for their screw cases than they have ever received.

The Shumard spring sash balance, manufactured by the Coleman Hardware Company, 55 Dearborn street, Chicago, is steadily growing in favor, and is giving excellent satisfaction wherever used, both in public buildings and private dwellings. It has now been on the market since 1893. The company are also manufacturing a special

balance for use in railroad cars, and have already sold the Chicago and Alton Railroad over 3000 for their cars. Orders for the balance are coming in not only from every part of this country, but also from foreign countries. The spring in this balance takes the place of cords and weights.

Miscellaneous.

The firm of Knowles, Taylor & Anderson, of East Liverpool, Ohio, have been awarded the contract for furnishing the city of Williamsburg, Pa., with 15 miles of gas-fired, granite sewer-pipe, ranging in size from 6 to 24 inches in diameter.

A dispatch from Ishpeming, Mich., under date of the 5th inst., reads as follows: "Five men were instantly killed in the Cleveland Iron Mine, at this place, this evening in the bottom of No. 3 shaft. They were blasting out rock, working about a diamond drill hole, and inserted a piece of gas-pipe charged with dynamite. The pipe had just come from the blacksmith shop, where it had been heated, and it is supposed that it was still warm enough to cause the terrible agent of destruction to explode, for all five men were instantly killed."

A dispatch from Cleveland, Ohio, under date of the 5th inst., reads as follows: "Cleveland vessel owners representing more than one-half of the ore and bituminous coal carrying tonnage of the lakes met here to-day and signed an agreement not to start a boat until May 1, which is two or three weeks later than usual. The owners of ore-carrying boats are, of course, involved in the present fight between iron producers and consumers. They feel that the coming year will be an active one in the iron trade, notwithstanding the present bad features of the situation, and this action is taken as a safeguard against season charters at low rates. Vessel owners at all ports on the lakes will be asked to join in the movement. A substitute for the Nutting bill, which aims to prevent overloading of boats on the lakes, was recommended."

Hunt & Clapp, of Pittsburgh, have sold their magnesia sectional covering business to the Pittsburgh Pipe Covering and Belting Company, Limited, composed of F. F. Turner, Dr. Wm. Brinton and S. V. D. Huntingdon.

The Tamarack-Osceola rolling mill, at Dollar Bay, Mich., will probably be rolling sheet copper in a month or six weeks.

Licenses of incorporation under the laws of Illinois have been issued to F. M. Hicks & Co., at Chicago, with a capital of \$25,000, to manufacture architectural iron, the incorporators being F. M. Hicks, M. L. Willard and A. A. Bliss. Also to the Fair Play Lead Mining Company, with a capital of \$500,000, and H. K. Richmond, E. D. Meloy and J. M. Cameron as incorporators. Also to the Chicago Cigar Box Nail Company, with a capital of \$14,000, and Henry Eder, C. F. Collot and Ernst A. Loeffler as incorporators, to manufacture wire nails.

The following companies have recently been incorporated in Illinois: The Goetz & Brada Mfg. Company, at Chicago; capital, \$50,000; to manufacture copper and iron work; incorporators, Frederick Goetz, Charles Brada and Claes Flodin. The Pennsylvania and Indiana Natural Gas and Oil Company, at Chicago; capital, \$300,000; to develop and produce natural gas and oil; incorporators, R. Clarke Forsyth, John J. Forsyth and Dennis W. Sullivan. The American Button-Hole Attachment Company, Chicago; capital, \$20,000; incorporators, J. S. Buhrer, J. S. Shoemaker, and A. W. Rasmussen. In Wisconsin a charter of incorporation has been granted to the Eames Pulley Company, Racine; capital, \$20,000; incorporators, John Kretcher, Gardner T. Eames, Adolph Weber, and others.

THE WEEK.

Flour is being taken by steamships to Europe on through shipment from the West at about ballast rates, in the absence of grain for ballast.

In weight of metal and in speed, according to a Paris correspondent, the French naval strength is vastly inferior to that of Italy; but he believes that this advantage can scarcely compensate for the superior quality of the French officers and crews. Italy has 15 ironclads of the first class, which have plates on an average 4 inches thicker than those used by the French fleet. Their velocity, too, is remarkable; it varies between 16 knots for the Italia and the Lepanto, and 17 for the Lauria, while none even of their old-fashioned vessels sails less than 7 knots per hour.

The first sugar mill in Florida of large capacity was christened at St. Cloud on the 5th inst. by Mrs. Hamilton Disston, of Philadelphia.

Master Workman Powderly, in a letter just written, advocates the acquisition by the General Government of the coal fields of Pennsylvania, and asks for agitation for the attainment of this end.

Retrenchment is the order of the day in some of Pennsylvania Railroad Company's workshops, and men are being discharged.

The port of San Diego, in Southern California, aided by Boston capitalists, aspires to a front rank on the Pacific coast. There are now, says a San Diego paper, 48 deep-water ships en route to San Diego from New York, Baltimore and various foreign ports, of which three are from Liverpool, four from London, and 33 from Newcastle. The total tonnage of this fleet is 51,211, against a tonnage of 4118 a year ago. The city claims a present population of 30,000 and to be increasing 2000 per month. Buildings of the value of \$206,000 have been ordered during the last few days.

One of the Park Commissioners says the contemplated enlargement of the National History Museum will cost \$800,000. The Board of Estimate and Apportionment consents to an expenditure of \$300,000 for this purpose.

The Boston Chamber of Commerce, at a meeting held last week, adopted resolutions urging that Congress take proper measures for the revival of the merchant marine, declaring as timely the bill introduced in Congress by the Hon. Amos J. Cummings, and known as "the tonnage bill," recommending this bill for immediate passage on the ground of its necessity "to meet the protective legislation, and artful evasions of free and reciprocal transportation treaties with foreign nations." The resolutions declare also "that the United States mails ought to be carried between this and foreign countries in American ships and under our own flags as soon as practicable consistently with certainty of the service, and for such service this Government ought to pay just compensation; that the vast interests of this country entitle them to a foreign mail service, the promptness and certainty of which shall be insured in peace and in war by national patriotism, pride and ambition, to extend our influence, commerce and our markets throughout the world."

General Greely, the chief signal officer, in a paper lately read before the Washington Philosophical Society, declares that no part of the West can now positively be declared rainless. The area in which the rainfall has been popularly supposed to be less than 15 inches has been reduced by 1,000,000 of square miles since the census map of 1880 was prepared. Investigating

the so-called "arid region," he discovers that the actual rainfall there is not less than 16 inches and in one locality 37. In refutation of the old notion that wheat could not be grown with less than 20 inches of rainfall, he cites statistics from Dakota, showing that the grain was abundantly raised in the counties where the fall was between 13 and 15 inches only. These important results have been obtained from observations conducted at 100 stations in 12 States and Territories, and go far to sustain the assertion that the so-called "American Desert," in nearly all its vast area, is available for the production of grain.

The sensible suggestion is made that rather than retaliate by refusing to participate in the French exhibition, on account of the recent prohibition of American pork, it might be more politic to take advantage of the opportunity and place in the group of "food products" the most perfect and appetizing display that the American hog makes possible.

The Emperor William, of Germany, died on Friday morning, 9th inst. Had he lived 13 days longer he would have completed his 91st year. On the day following the Prussian Royal and German Imperial thrones passed directly and simultaneously to Frederick William, the late Crown Prince. He was proclaimed by the Reichstag as Frederick III. The old forms of electing kaiser are dispensed with under the new regime. Should the present Emperor prove physically or mentally unable to rule, a regency will be established, but the actual succession is accomplished and can in no way be invalidated. The individual really most affected by the change is his wife, the daughter of Queen Victoria, who becomes Empress of Germany, with all the honors and incomes thereto appertaining. William succeeded to the throne of Prussia on the death of his brother in 1861, after having been for three years acting as regent. His greatest triumph was the unification of the German Empire.

The last steel gun made at Pittsburgh was taken from the annealing furnace, and its strength was officially tested with satisfactory results. The ultimate strength per square inch was shown to be 81,420; elastic limit, 40,970; elongation in 2 inches, 27 per cent.; reduction of area, 45.41 per cent. This test was made by request of Superintendent Hainsworth on the part of the Pittsburgh Steel Casting Company, and Lieutenant Eaton said it was an exceptional piece of steel. The piece tested was cut from the trunnion of the gun.

Further light respecting the formation and operation of the \$50,000,000 sugar trust was given by John E. Parsons, attorney for the company, in his testimony before the House Committee on Manufactures. He said there were no formal committees within the board, but that certain gentlemen were deputed to look after that part of the business with which they were most familiar. For instance, Mr. Havemeyer was a member of the board and also at the head of one of the sugar corporations, and it might sometimes be difficult to tell just whom he represented. His interest, however, always led him to look to the board's interest. The agreement prohibited individuals from buying sugar without knowledge of the board. The total capitalization of the sugar refinery company was \$50,000,000. All of the stock had been issued to the original parties of the agreement, with the exception of 15 per cent., which had been retained. Of this 15 per cent. about \$2,500,000 had been issued to parties who came in subsequent to the original agreement. The transfers of stock, he said, were in the name of the members of the

board as individuals, for the reason that the board was not an entity at all. The Sugar Refinery Company was simply a mere name adopted for convenience. The company was not incorporated under the laws of any State. The agreement provided that the corporations when they came into the agreement should be free from liability or should provide for discharging their liability. The reason for this was that the transaction amounted to purchase by the stockholders of each one of these corporations of stock in the others, and the value of the stock was therefore dependent on whether each corporation was free from debt. In order to prevent any inequality, it was required that the parties interested in each corporation should take care of then existing indebtedness, so that a new departure might be taken from the 24th of October. Each company, witness said, employed its own officers, fixed their salaries and paid all other expenses. Over that subject the trustees exercised no control. The practical result of the aggregation of capital as in this trust was to steady the business and prevent an irregular market.

The Dominion Government, it is said, expects to profit from the withdrawal from service of the Australian and New Zealand steamship line trading with San Francisco, which is announced as a coming event, to take place in November next, when the present contract expires. An agent of the Dominion Government is said to have been working up a feeling in favor of abandoning the San Francisco mail route and taking up the Canadian Pacific instead. Great inducements are held out to the Australian colonies to adopt this plan. The programme is to run a fortnightly line of fast steamers between Vancouver, the Pacific terminus of the Canadian Pacific, and the port of Brisbane, in Queensland, Australia. These steamers would touch at Fiji and transfer New Zealand mails and passengers to a steamer in waiting to receive them. A subsidy of \$500,000 is asked by the Canadian Pacific for this service, to which all the colonies are expected to contribute.

The proposed viaduct on the Harlem River to enable people living on Washington Heights to reach the roadways leading to the annexed district is estimated to cost \$800,000, but the expenditure will probably be nearer \$1,000,000.

Decayed eggs are in demand by manufacturers of morocco leather in New Jersey.

West Virginia has magnificent resources awaiting development. Two-thirds of the State is underlaid with coal, its area reaching in extent 16,000 square miles, more than that of Pennsylvania or England, while six navigable rivers flow through its borders. Agricultural lands within 300 miles of tidewater, comprising large tracts of valuable timber, can be bought for from \$4 to \$8 per acre. The total area is 24,780 square miles, more than twice as large as the State of Maryland and larger than Massachusetts, New Jersey, Connecticut and Rhode Island combined. The coal lands, it is claimed, will yield from 5000 to 6000 tons per acre. In order to bring these facts before the public a convention of 1000 representative business men was held at Wheeling a few days ago and an organization formed to devise means by which this vast natural wealth can be opened to immigration and made available to manufacturers and capitalists.

A yellow pine lumber trust is said to be in process of formation in the principal lumber states.

The deepest well drilled in the United States is that of George Westinghouse, at Homewood, near the city of Pittsburgh, which, on December 1, 1886, had reached

a depth of 4618 feet, when the tools were lost and the drilling ceased. The Buchanan farm well of the Niagara Oil Company, drilled by Frederick Crocker in Hopewell township, Washington County, is 4303 feet deep. The Rushwell, of the Niagara Oil Company, in Washington County, was abandoned at 3300 feet. The deep well of Jonathan Watson, near Titusville, was drilled about 3500 feet. J. M. Guffey & Co.'s well, on the Walz farm, at West Newton, Westmoreland County, was drilled to a depth of 3500 feet. The well of Isaac Willets, at Sargent's Mills, near Sycamore, in Green County, was abandoned at 3008 feet.

The entire sorghum crop of the country, it is said, is liable to pass into the control of a company in Boston, who claim to be able to produce sugar from sorghum cheaper than cane sugars, even if the latter should be admitted free of duty. In addition to the sugar works now at Fort Scott, Kan., the company, during the coming summer, will erect three new factories, one of them at Topeka. The location of the other two has not yet been selected. Difficulty may be experienced in carrying out this plan from the fact that the Department of Agriculture has taken steps to have the patents above referred to declared invalid. A document prepared by the United States Attorney General sets forth that the device is not patentable; that the improvement is of great public importance; that the knowledge thereof by the Department of Agriculture was the result of examination and experiment by persons employed by the Department for that purpose, and that this industry should be made available to all citizens of the United States who desire to engage therein.

The difficulty that young men experience in searching for employment as apprentices in the various trades is the subject of a letter written by Mayor Hewitt, which is entitled to serious consideration. He says: "Under the regulations adopted by the various trades unions the number of apprentices is limited, so that there is growing up in our midst a large number of young men who cannot find access to any mechanical employment. This is a lamentable state of affairs, because these young men are practically turned loose upon the streets and grow up in habits of idleness resulting in vice and crime. If the action of the trade societies in this matter really limited the competition of employment it might be defended at least upon selfish grounds, but inasmuch as foreign workmen are free to come to this country in unlimited numbers, the only effect of these regulations is to keep our own young men out of useful employment, which is freely opened to those who are born and trained in foreign countries. The evil is of the most serious character, and I trust that this statement of it may lead to a reconsideration on the part of the various trades organizations, who now restrict the right of employment without benefit to themselves, but to the great injury of the rising generation."

Manual training schools recently established in St. Paul and Toledo are so successful that an extension of the system is favored by the boards of education in the two cities, and the subject is receiving attention in Detroit, as well as at other points in various parts of the country.

An American merchant doing business in Samoa, where German influence now predominates, the new King being but a puppet in the hands of the German consul, is now in Washington City seeking to obtain relief for Americans in those islands, who appear to have no adequate protection and in some instances to have received arbitrary treatment affecting their rights of property. It is understood that

the State Department has requested the German Government to agree to the appointment of a council composed of one representative from each foreign treaty power to constitute a cabinet of advisers for King Tamassese. This council would make a new code of laws for the government of the islands. The German Government is said to have declined to accede to the proposition. The matter will now be laid before Congress.

The Legislature of Newfoundland has received a formal invitation from the Governor-General of Canada to confer with a view to the absorption of that colony in the confederation. Traders in Newfoundland are strongly averse to the scheme.

Iron-ore carriers on the lakes are combining to secure profitable charters during the season to open May 1, two or three weeks later than usual. Vessel owners at Cleveland have formed an agreement with this object, and the movement is expected to become general at the lake ports. It is stated that no part of the season's product of the Lake Superior iron mines has yet been sold.

The Globe Iron Works Company, at Cleveland, launched a few days ago a steamship of 2650 tons capacity for the Lehigh Transportation Company, the fifth built for the same company within 18 months, each costing about \$250,000. Six steamships of equal dimensions are to be built at the Globe Iron Works for the Manitoba Company, one of which is approaching completion.

The Massachusetts State Board of Arbitration have submitted their second annual report to the Legislature, and in it they cite a number of facts showing the good results of arbitration for the settlement of labor difficulties. They say: "There appears to be an increasing aversion to strikes and a more ready acquiescence in the adoption of methods that appeal to the sense of justice and to right reason. The very existence of a board ever ready to entertain such appeals, from whatever quarter they may come, is of itself a reminder of the excellence of peaceful methods in comparison with strife; and thus employers and employed are compelled, as it were, to choose their positions more carefully, to be more reasonable in their demands and more ready to make concessions for the purpose of meeting and proceeding together on common ground for their mutual advantage."

Recent railroad troubles have caused a revival of the plan of licensing locomotive engineers, the license to be issued by the Federal Government, and bestowed upon none but competent men, whose abilities are to be judged by a Federal Board of Examiners. It is claimed that marine engineers hold their positions by virtue of Federal license, and that in some States stationary engineers are compelled to take out State licenses, and it is equally just and fair that locomotive engineers, who hold far more responsible positions, should be controlled by the same restrictions. A bill has been prepared, and will be offered in Congress, embracing the following provisions: To bring all branches of engineers under Government control, to provide for a board of examiners, to compel all railroads to employ only licensed engineers, for the payment of engineers graded according to ability, length of service and skill, to empower the revocation of the diplomas for cause, to establish a commissioner of engineering to rank next below a cabinet officer, to endow the board with detective powers, to investigate all violations of the act, and to hold examiners responsible to the Government for the diplomas given to the engineers. The idea has been considered at some length by railroad officials and engineers, and is

viewed with various results. The strongest opposition to the scheme came from T. V. Powderly. He said: "The idea is not feasible unless the Government assumes control of all railroads and then subjects the directors to the most rigorous examinations as to their ability to handle the finances and the superintendents as to their competency to control the service of the road."

The Senate Committee on Coast Defenses has practically agreed to report favorably the bill introduced by Senator Dolph to provide for fortifications and sea coast defenses, with an amendment providing that the gun factory to be established shall be located at the Watervleit Arsenal, New York, instead of the Frankfort Arsenal, Pennsylvania. The bill provides that there shall be appropriated \$126,378,800 for fortifications. Of this amount \$21,500,000 is to be expended during the fiscal year 1889, \$9,000,000 during the eleven fiscal years thereafter, and \$5,877,800 during the fiscal year 1901. The House Committee on Military Affairs has determined to recommend for passage the Cutcheon bill, appropriating \$7,475,000 for the public defense. The bill appropriates \$750,000 for an army gun factory at West Troy, \$5,000,000 for the purchase of steel for large guns, \$500,000 for the purchase of material and manufacture of 12-inch breech-loading rifled mortars, \$225,000 for breech-loading steel field guns; \$500,000 for testing the guns, and \$500,000 for submarine mines and torpedoes. The guns and mortars are to be manufactured at the West Troy factory, and the appropriation is available until expended.

Highly favorable reports are being received from the New York Trade Schools, which now occupy spacious buildings on First avenue and Sixty-seventh street. The classes are increasing in numbers and the sessions are held every evening. The bricklaying class numbers 119 and is divided into two sections. In the blacksmith shop there are 12 young men under instruction. Graduates from the stonecutters' class are already giving satisfaction to master mechanics by whom they are employed, the testimony from this source being to the effect that they do much better than boys who start in the usual way. The class of student plumbers has been recruited in some instances from distant parts of the country, and thrice a week Master Plumber Murphy delivers lectures on theoretical and practical plumbing. Among questions asked are such as these: "What is a standing overflow in a bath?" "Of what are kitchen sinks usually made?" "Is it advantageous to have an independent ventilating pipe larger or smaller at the top?" "State some of the chief sanitary arrangements of a soil pipe?" "Will the water in a trap absorb gas and emit it again?" "Does a large body of water afford greater resistance to pressure from the sewer?" "How should a lead pipe be joined to an iron pipe?" "What precautions can be taken against freezing if the main is within 3 feet of the surface?" "Do boilers get dirty, and why?" A class was recently examined by a committee from the Master Plumber's Association, by whom their term of apprenticeship is shortened one year in consideration of their acquirements under school instruction. The Journeyman Stone Cutters' Association also allow the time served in the school as part of their apprenticeship. The new technical school in Brooklyn is understood to give excellent promise, and the technical school in Philadelphia already enjoys a wide reputation. It is found that while clerks and salesmen starve on \$12 a week and professional men fare little better, a bricklayer or plumber can earn \$4 a day without the necessity of wearing his best clothes.

The Iron Age

New York, Thursday, March 15, 1888.

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Minimum Freight Rates.

The very low through rates to Europe which the railroads have been quoting at intervals for a year and the unusually cheap transportation which has lately been offered to shippers on the lines north and west of Chicago have caused discussion upon the subject of minimum freight rates. The establishment of maximum rates by law is as old as the locomotive. The early English railway charters all contain them and they are nominally yet in force. We say nominally, for experience has repeatedly shown that they have no practical bearing upon the complicated problems of transportation which press for solution in England. On the other hand, minimum rates have been discussed, but scarcely advocated. It was hardly expected that railroads would carry traffic at an actual loss. Under the old pooling system we had many instances of such cut-throat competition indulged in by the railroads, not so much to further legitimate rivalry as to force some offending member of the pool to accept the decision of the others. Under our present law prohibiting pools this particular temptation is removed, but the strife for competitive traffic is intensified. The Interstate law by its short-haul clause and by its enforcement of publicity does what it can to restrain the rivalry of roads from degenerating into war. A long continued carriage of goods below cost of service is a damage to the railways themselves and to every industry as well. When we consider that charges for transportation form an important part of the value of any article, we can see that steadiness of rates within reasonable limits is essential to steadiness of cost and profit of manufacturing or of trading. Violent fluctuations of railway rates may benefit those who are fortunate enough to take advantage of the opportunity, but their effect upon general business is speculative and unhealthy.

With those objections in mind it is proposed by some correspondents of the papers that minimum rates be established by law. The practical difficulties are, however, insurmountable. What should such minimum rates be based upon? Should they include fixed charges? If yes (and we cannot deny that a fair return is due to bondholders) the resulting rate is too high, and would stop half the low-price traffic. If the average rate per ton per mile, as figured out in the report, should be taken, we again stop the transportation of such articles as pig iron, for an average rate means that there are actual rates both above and below it. Further, any naming of rates by our legislative bodies is to be deprecated for well-known reasons, and minimum rates would involve that, should it become necessary. It may be possible,

however, to get at the matter in another way. Carrying traffic below cost of service is a wrong either to the stock and bond holders, or, if the loss be made up on other freight, to the shippers. It is also a well-known fact that if one company inaugurate a reduction of tariffs all competitors must at once reduce their tariffs, too, or injure their future business, no matter how much they may be opposed to such reduction. The suggestion then is this: Let the Interstate Commission be empowered to state (as they already have done as a principle) that the carriage of traffic below cost of service is illegal. Let any investor, any shipper or any competing railroad be allowed to enter complaint against any carrier for such carriage below cost. Upon such complaint let the commission begin a thorough investigation into all the circumstances of the case and render decision accordingly upon the one or more articles and at the particular time specified. Let this decision be always open to review as improvements in transportation may be made. It is to be hoped that the provisions of the Interstate law as it stands will prevent any permanent losses from continued wars, but if proved ineffectual we may try such a further plan as we have sketched.

The Blast Furnaces on March 1.

As will be noted from the figures we print below, there has been quite a heavy reduction in the weekly output of pig iron during February, and the industry entered the month of March with a rate of output more closely approaching the current demand, as indicated by prices ruling. The largest reduction relatively is among the stacks owned or controlled by Bessemer steel mills, so that while the number of plants in operation is not materially affected, the dropping out of line of a few individually large producers tells heavily on the capacity at work.

In spite of the fact that the strike was virtually over, the anthracite furnaces entered the month of March with a lessened aggregate capacity, although the number is greater by one. The status on the 1st of March was as follows:

Anthracite Furnaces in Blast, March 1.

Location of furnaces.	Total number of stacks.	Number of furnaces in blast.	Capacity per week.	Number of furnaces out of blast.	Capacity per week.
New York	29	12	3,021	17	5,067
New Jersey	15	5	1,703	10	3,135
Spiegel	3	2	156	1	63
Pennsylvania:					
Lehigh Valley	48	27	7,385	21	5,972
Spiegel	1	0	0	1	40
Schuylkill Valley	41	22	5,504	19	4,956
L. Susquehan. Val.	24	10	8,007	14	4,392
Lebanon Valley	15	11	4,730	4	2,390
U. Susquehan. Val.	18	9	2,802	9	1,625
Maryland	4	0	0	4	892
Total	128	98	28,308	100	28,447

	Furnaces in blast.	Capacity per week.
March 1	98	28,308
February 1	97	29,989
January 1, 1888	118	38,206
December 1	122	39,487
November 1	124	40,028
October 1	128	39,440
September 1	125	38,338
August 1	129	37,530
July 1	128	40,742
June 1	138	44,188
May 1	137	43,802
April 1	136	43,585
March 1	141	43,724
February 1	137	41,951
January 1, 1887	136	40,736

In New York the Cedar Point furnace blew out on the 22d ult., on account of a gas explosion in the blast-pipe, the damage to be repaired at once. In the meantime Port Henry No. 3 was ordered in, and was expected to begin work on the 10th to run on foundry iron. One of the Fallkill furnaces was put in on the 29th ult., but on the other hand both Hudson are idle in consequence of an accident. In New Jersey Chester, Franklin, Oxford, Pequest and Secaucus continue to be the only stacks in operation, their aggregate output in February being 6952 tons, against 7633 tons in January. In the Schuylkill Valley only one Brooke furnace was running on the 1st inst., but, on the other hand, Lucinda was again in operation, and the two Pioneer furnaces had been just started in after having remained banked since the 9th of January. Topton, however, was out. In the Lehigh Valley the production has been lessened considerably by the fact that the last of the Carbon furnaces has gone out, that Durham has stopped on account of poor quality of coal, to resume in April, and that only one of the five Glendon furnaces is in operation. In the Lower Susquehanna district there has been little change, while the only thing that is reported from the Upper Susquehanna is that one of the Montour furnaces is blowing out.

The status of the coke furnaces was as follows:

Bituminous and Coke Furnaces in Blast March 1.

Location of furnaces.	Total number of stacks.	Number in blast.	Capacity per week.	Number out of blast.	Capacity per week.
New York	3	0	0	3	3,900
Pennsylvania:					
Pittsburgh district.	19	13	9,807	6	8,075
Spiegel	1	0	0	1	563
Shenango Valley	19	13	8,077	6	3,021
Juniata & Conem.	32	13	5,890	9	2,060
Spiegel	1	1	297	0	0
Youghl. Valley	5	3	1,051	2	990
Miscellaneous	2	2	325	0	0
Maryland	2	0	0	2	340
Virginia	12	8	3,780	4	1,885
West Virginia	6	2	1,631	4	1,730
Kentucky	4	3	930	1	300
Ohio:					
Mahoning Valley	14	10	6,410	4	3,212
Hocking Valley	15	6	1,819	9	1,672
Hanging Rock	14	10	1,874	4	825
Miscellaneous	17	12	7,585	5	2,836
Illinois	16	9	9,413	7	9,500
Missouri	8	2	1,527	6	1,250
Wisconsin	5	1	706	4	1,330
Indiana	2	2	353	0	0
Michigan	1	0	0	1	290
Alabama	13	8	3,650	5	1,975
Tennessee	9	6	3,025	3	1,030
Georgia	2	2	817	0	0
Colorado	1	1	490	0	0
Total	211	128	68,892	83	46,744

	No. of furnaces.	Capacity per week.
March 1	128	68,892
February 1	136	73,912
January 1, 1888	143	82,101
December 1, 1887	144	88,835
November 1	151	90,459
October 1	152	89,123
September 1	145	89,124
August 1	113	62,091
July 1	95	47,319
June 1	48	44,865
May 1	148	83,509
April 1	148	81,796
March 1	146	79,682
February 1	145	79,257
January 1, 1887	137	73,422

The three Troy furnaces are still banked. In the Pittsburgh district all the furnaces of Carnegie Bros. & Co., at the Edgar Thomson Works, are either out or banked. Clinton furnace, of Graff, Bennett & Co., the suspended firm, will soon blow out, and Soho, of Moorhead-McCleane Company, is to go out for the purpose of being enlarged and rebuilt. In the Juniata and

Conemaugh Valley district Powelton, which was idle for six weeks, owing to a strike, resumed on the 15th ult. In the Shenango Valley there have been no changes. In the Youghiogheny Valley one Dunbar was running again during the greater part of the month of February. Rebecca blew out early this month. In Virginia Pulaski has been added to the plants producing, the output of the Virginia furnaces having been 13,490 tons in February, against 13,070 tons in January. In West Virginia Riverside and Irondale alone are running, Belmont being out on the 1st inst., while Top Mill was still banked. In Central and Northern Ohio Emma blew in on the 27th ult., while the other plants maintained the same status, the majority, however, turning out a little less iron. In the Hanging Rock region no changes were reported, the aggregate output being close to 8500 tons in February. In the Hocking Valley Gore has shut down for repairs. In Illinois there has already been quite a heavy falling off in the output, the make for February being only 42,096 tons, against 53,921 tons in January. One of the Chicago and one of the South Chicago furnaces stopped making iron, and March will probably witness a further decline to less than 40,000 tons. In Wisconsin Minerva is out, leaving only one of the Bay View stacks at work. In Missouri Jupiter ran only 16 days in February, and the furnace of the Western Steel Company made one-third less than usual. One of the Missouri furnaces is to go in on or about May 15. In the South Bibb is out for relining, and at Dayton one of the stacks was inactive during the greater part of February. Chattanooga is again running. Eureka is putting up an additional hot-blast stove, which will probably be completed in about six weeks.

Turning to the charcoal furnaces we find comparatively few changes. In New York one of the Plattsburg furnaces had just blown in at the beginning of the month. In Pennsylvania Eagle is again active, but, on the other hand, Pine Grove has been out since the 3d of February, to resume in the first half of April, when the aim will be to make forge and car-wheel chill iron only. In Maryland the only active furnace continues to be one of the Stickney. Maryland is, however, preparing for a blast to begin in a few weeks. So far as we can learn there was not a single charcoal furnace running in Virginia on the 1st of March. Walton blew out on the 17th ult. for want of stock, and is not expected to resume before June 1. White Rock is to go in about April 1. We may state that Brown Hill furnace is to be altered into a hot-blast furnace during the year, during which time it will remain idle. In Kentucky only Bellefonte is at work, Hunnewell to be idle till May 15. In the Ohio Hanging Rock region Bloom is out till April 1, and Olive, too, is temporarily idle. Madison, Mt. Vernon, Pine Grove and Scioto are running.

In Michigan, Antrim, Bangor, Deer Lake, Detroit, Elk Rapids, Fayette, Gaylord, Peninsular, Pine Lake, Pioneer, Spring Lake, Union, Vulcan and Gogebic are running, Martel having banked until April. In Wisconsin National was putting in a new hearth on the 1st inst., but has

since resumed. In Missouri Sligo and Midland are running; the former, however, will stop in April for repairs to its bosh. In Tennessee La Grange was banked on the 27th ult. on account of exhaustion of fuel, and in Alabama both the Woodstock furnaces, too, are banked, to remain in that condition for about three weeks.

The Western Cut Nail Trade.

The advance in the Western cut nail card, which was agreed upon at Pittsburgh on the 8th inst., was a natural result of the condition of the trade. It often happens that such advances in the price of commodities are artificial, and are merely the result of a determination among producers or manufacturers to realize greater value for their goods, although circumstances may not entirely warrant such a step. But the advance just made in the price of nails has been foreshadowed for some time.

In the first place, the demand has latterly been very heavy. Stocks in the hands of Western jobbers have been unloaded with remarkable celerity, and many of them have been unable to receive nails rapidly enough to supply the wants of their customers. This has been stated from week to week in our market reports. It is true that but little fear was expressed of an advance in prices, but that was because a large number of nail factories were known to be shut down, presumably for lack of orders, and it was reasonable to expect them to re-enter the field as the demand widened. But not a few of these factories, and perhaps nearly all of them, were closed because the manufacture of nails at recently ruling prices would have been a losing business for them. The active factories were those which could in some way manage to make both ends meet or even to extract a little profit from the business despite low prices. As their facilities of production became taxed it was hardly likely that they would continue to supply nails at very low rates. There has virtually been a restriction of production without a formal agreement to that effect.

In the second place, an advance in the card rate has for some time seemed to be impending from the fight between manufacturers and merchants over specifications. When the price of nails fell to the lowest point the manufacturers almost invariably insisted on buyers making what they termed "good specifications." By this they meant such an addition of extra sizes to the usual run of base sizes as to make the average per keg run up to 25 cents or more above the current quotation. As long as assortments of such a character could be anticipated merchants were not unwilling to place orders in this way. It is easy to be seen, however, that as the heaviest consumption of nails is in the base sizes such a policy would inevitably come to grief in time. Merchants would not continue to lay in stocks of small nails far beyond their requirements simply to get large nails at low prices. For some time manufacturers have found this to be the case, much difficulty being experienced in securing these "good specifications." Inasmuch as the persistent adherence to this policy is quite strong evidence that there has been no profit, and perhaps dead loss, in cutting large nails, the difficulty

in getting "good specifications" brought the manufacturers face to face with a problem which had to be solved. The base price had to be advanced or factories be closed to avoid running at a loss.

The heavy demand for nails—that is to say, heavy in consideration of the limited number of factories in operation, has made the further suspension of operations undesirable, and the alternative of advancing the base price has been chosen. This advance is so conservative, so reasonable and so timely, that it ought to be sustained. It is not a wild jump, made after heavy buyers have been loaded with large stocks and favored with good contracts for future delivery. This advance will not be mainly for the benefit of others, but will inure to the advantage of the manufacturers. Possibly some of them will now be able to extract a little profit from an important part of their business, which seems to have been managed quite foolishly of late.

It may be argued that the Western cut-nail manufacturers are attempting an impossibility in endeavoring to advance their prices at a time when most iron and steel products are declining in value. The same criticism will apply equally well to the wire-nail manufacturers and to the barbed-wire manufacturers, who have advanced their prices. The reply is that in each of these branches of trade prices have been abnormally low—so low that during the past year of great prosperity in most lines the makers of cut nails, wire nails and barbed wire, with a few brilliant exceptions, have been struggling to keep afloat. The advances they have now made may have simply put them on a par with their fellow manufacturers in other lines. They may be entitled to no more, but they most undoubtedly deserve no less.

Copper Speculation.

The newspapers are giving considerable attention to the operations of the copper syndicate, some of them making strenuous efforts to create the impression that it is one of the odious trusts which has grown up under the fostering care of the tariff. The argument is: Copper is cornered and there is a duty on the metal; therefore, the tariff made the corner possible; hence, justice to a suffering consumer demands that the vicious system which will shield such iniquity must go. It is charitable to believe that such reasoning is due rather to ignorance than to a deliberate suppression of the facts. A fair examination of the latter will show that if anything they rather point to the conclusion that there is more danger to the American consumer in gigantic syndicates when we are merely one of many contributors to the world's markets.

The great decline in copper throughout the world from 1884 to the fall of 1887 was primarily and almost exclusively due to the enormous increase in the production of the United States. The shipments to England and France from our country jumped from 1780 gross tons in 1882 to 33,272 tons in 1885, declining, it is true, to 17,560 tons in 1886 and to 20,444 tons in 1887, against the following figures for Chili: 42,306 tons in 1882, 20,394 tons in 1885, 35,448 tons in 1886, and 29,091 tons in 1887, while Spain and Portugal shipped to France and England during the same years, excluding pyrites to our port:

24,934 tons in 1882, 30,174 in 1875, 29,664 tons in 1886, and 33,160 tons in 1887. In other words, of the whole supply of these two great markets of the world the United States sent only a little under 2 per cent. in 1882. It supplied nearly 27 per cent. in 1885, almost 15 per cent. in 1886 and 20 per cent. in 1887. It will be readily understood how a country which had become so large a contributor to the world's markets must necessarily come down to its parity for the home market, too, whatever the duty might be. Every producer naturally sought near-by customers, either to introduce his particular brand or to hold trade against the encroachments of new rivals. The natural result was that, broadly speaking, our market fluctuated with that of the world, and the metal was as cheap and sometimes cheaper here than in London or Paris. It is true that years ago, when the trade here was controlled by a few and the surplus was small, the excess was sold abroad at lower prices than at home. But since 1882, when there has been the sharpest rivalry between old and new producers, and even between the leading mines in the old "ring," since the quantities grew too large and too much diversified in character of ownership and of quality—since then it has been impossible to use the duty as a cover to exact an extra price from American consumers. Whether or not American mine owners, notably those of Montana, were wise in slaughtering their rich surface ore in this manner may be questioned. It is probable that they would have done far better in the long run by husbanding their resources and by making a fair profit on a small output. But the fact remains that they were largely instrumental in driving down the market, and with that course completely abandoning any benefit which the tariff might have possibly enabled them to secure.

To make a handle of the operations of the syndicate to attack the duty on copper, therefore, borders on the absurd, especially since the producers themselves confess that they do not care what is done with it. It may be questioned whether the syndicate would have paid the slightest attention to the American mines any more than to the Mansfeld Company, in Germany, with its annual output of 25,000,000 pounds, if our home producers had been able to supply only our home market. The managers of that gigantic operation knew that we could swamp them, and that practically we were on the same footing as any other country in spite of our tariff. The great copper and tin deals, on both of which articles we have no duty, show that free trade is no impediment to great cornering operations. All that is necessary is greater financial resources, which, in these days of enormous aggregations of capital for speculative operations, is no obstacle.

The only grievance which the American copper consumers have is that our miners have allowed themselves to be entangled in this corner. Practically all the great producers, so far as known, with the exception of the Parrott, in Montana, the Copper Queen, Detroit, and Old Dominion, in Arizona, and the Atlantic and Central, on the lake, are fellow conspirators. The immediate gain to all of them is enormous, and with few exceptions the opportunity will probably be seized by those

who are guiding spirits to let the public have the stock of the mines at inflated valuation. They will probably be successful, since the purchasers will buy in the expectation of finding some more eager speculator. But in the long run the copper mining interests of the United States as well as those of other countries must suffer frightful hardships. The longer the present inflation lasts the more protracted will be the depression which will be sure to follow. We have insisted again and again that the present price of 16 cents is far in excess of the moral value, considering cost of production, with a sufficient profit added to secure an output ample for the world's consumption. A price of somewhere between 11 and 12 cents is sufficient to supply this country with all the copper it needs for its own use.

Taking the Lake, for instance, we know that the Tamarack can lay down 14,000,000 pounds annually at a cost of 6 cents, the Quincy 6,000,000 pounds at 7.5 cents, the Osceola 4,000,000 pounds at 10 cents and other mines at least 8,000,000 pounds at 11 cents, while the Calumet and Hecla, once over its present calamity, can produce 50,000,000 pounds at 7 cents. This is a total of 74,000,000 pounds at a cost of 10 cents or under. In Montana the Anaconda with 60,000,000 pounds capacity can make money at 10 cents; the Boston and Montana claims 30,000,000 pounds in 1888 at a cost of about 9 cents, and the Parrott paid dividends of \$36,000 for the first six months of 1887, which was the worst period known in the history of the copper market. It has a production of about 12,000,000 annually. Here we have a total of 100,000,000 pounds at less than 10 cents. In Arizona the Copper Queen with 7,000,000 pounds, the Detroit with 4,000,000 and the Old Dominion, with at least 5,000,000 pounds, can lay down copper in New York under 10 cents. In the three leading districts, therefore, our mines can turn out an aggregate of 190,000,000 pounds at a cost which leaves them a good profit at 12 cents. They have certainly an excellent bargain when they can get speculators to guarantee them 13 cents plus one-half the spoils over that figure. But somebody must ultimately carry the increasing load of copper until the weight becomes crushing, and then the world's markets will be demoralized for many years to come. It will probably be found then that the knowing ones have converted their holdings of stock into cash, leaving sanguine amateur copper-stock speculators to fight the struggle for existence.

Those who have witnessed the complete paralyzation of business caused by the snow storm of the past few days will not be surprised to notice the absence of the usual market reports in this week's issue of *The Iron Age*. To add to the difficulties of a situation which in itself caused a practical suspension of business on Monday and Tuesday, *The Iron Age* has suffered from special causes. The Williams Printing Company had begun last week the removal of a part of its plant from 5, 7 and 9 Elm street to 490-502 Cherry street, a distance of over a mile. The storm caught it with part of its equipment at one place of business and part at another, at a time when the condition of all thoroughfares rendered the trans-

portation of heavy articles almost impossible, and, to add to the difficulty, a large part of the force were imprisoned at their homes.

MR. RANDALL'S BILL.

We print below that part of Mr. Randall's bill which includes the metal schedule:

The chief changes are: Antimony, $\frac{1}{2}$ cent per pound (now 10 per cent ad valorem); copper ore, $1\frac{1}{2}$ cents in each pound of fine copper contained (now $2\frac{1}{2}$ cents); old copper and clippings for manufacture, 2 cents per pound (now 3 cents); composition metal and ingots, plates or bars, $2\frac{1}{2}$ cents (now 3 and 4 cents); iron ore, 75 cents per ton, as at present, but a new provision is added forbidding deductions in duty on account of moisture; chromate of iron or chromic ore, 15 per cent. ad valorem; pig iron is unchanged at $\frac{3}{10}$ cent per pound.

The following are the main provisions relating to manufactured iron and steel: Bar iron, rolled and hammered, comprising flats not less than 1 inch wide nor less than $\frac{3}{8}$ inch thick, $\frac{9}{10}$ cent per pound; comprising round iron not less than $\frac{3}{8}$ inch in diameter, and square iron not less than $\frac{3}{8}$ inch square, $\frac{9}{10}$ cent per pound; comprising flats less than 1 inch wide, or less than $\frac{3}{8}$ inch thick; round iron, less than $\frac{3}{8}$ inch and not less than $\frac{7}{16}$ inch in diameter, and square iron less than $\frac{3}{8}$ inch square, 1 cent per pound; round iron, in coils or rods, less than $\frac{7}{16}$ inch in diameter, $1\frac{1}{16}$ cents per pound; rolled iron or steel fence-wire rods, coils or loops, valued at $3\frac{1}{2}$ cents or less per pound, 1 cent per pound. Bars or shapes of rolled iron not especially enumerated or provided for in this act, $1\frac{3}{16}$ cents per pound; provided that all iron in slabs, blooms, loops or other forms less finished than iron in bars and more advanced than pig iron, except castings, shall be rated as iron in bars and pay a duty accordingly; and none of the above iron shall pay a less rate of duty than 35 per cent. ad valorem; provided, further, that all iron bars, blooms, billets of sizes or shapes of any kind in the manufacture of which charcoal is used as fuel shall be subject to a duty of not less than \$22 per ton.

Iron or steel railway bars and railway bars made in part of steel weighing more than 25 pounds to the yard, \$14 per ton. Iron or steel T rails weighing not over 25 pounds to the yard, and iron or steel flat rails, punched, $\frac{7}{16}$ cent per pound. Iron or steel railway fish plates or splice bars 1 cent per pound. Iron or steel wheels or parts thereof and steel-tired wheels for railway purposes, whether wholly or partly finished, and iron or steel locomotive, car or other railway tires or parts thereof, wholly or partly manufactured, $2\frac{1}{2}$ cents per pound. Iron or steel ingots, cogged ingots, blooms or blanks for the same, without regard to the degree of manufacture, $1\frac{1}{2}$ cents per pound. Boiler or other plate iron or steel, sheared or unsheared, valued at 4 cents per pound or less, skelp iron or steel, sheared or rolled in grooves, $1\frac{3}{16}$ cents per pound; sheet iron or steel, common or black, valued at 4 cents per pound or less, thinner than $\frac{1}{8}$ inch and not thinner than No. 20 wire gauge, $1\frac{1}{16}$ cents per pound; thinner than No. 20 and not thinner than No. 25, $1\frac{3}{16}$ cents per pound; thinner than No. 25 and not thinner than No. 29, $1\frac{4}{16}$ cents per pound; thinner than No. 29 and all iron or steel commercially known as the common or black taggers, iron or steel, whether put up in boxes or bundles or not, $1\frac{5}{16}$ cents per pound; steel or iron sheets and plates, of all gauges and thickness, valued above 4 cents per pound and not above 7 cents,

2 cents per pound; valued above 7 cents and not above 10 cents per pound, $2\frac{1}{2}$ cents per pound; valued above 10 cents per pound, $3\frac{1}{2}$ cents per pound; corrugated or crimped sheet iron or steel, $1\frac{1}{10}$ cents per pound, provided that on all such iron or steel sheets or plates aforesaid, except on what are known commercially as tin plates, terne plates and taggers tin, and hereafter provided for, when galvanized or coated with zinc or spelter, or other metals, or any alloy of these metals, $\frac{1}{2}$ cent per pound additional duty shall be paid.

Polished sheet iron is unchanged. Iron or steel sheets or plates or taggers iron or steel coated with tin or lead or with a mixture of which these metals, or either of them, is a component part, by the dipping or any other process, and commercially known as tin plates, terne plates and taggers tin, $2\frac{1}{2}$ cents per pound. Hoop or band or scroll or other iron 8 inches or less in width, and not thinner than No. 10 wire gauge, $\frac{1}{10}$ cent per pound; thinner than No. 10 and not thinner than No. 20, $1\frac{1}{10}$ cents per pound; thinner than No. 20, $1\frac{3}{10}$ cents per pound; provided, that hoop iron or hoop steel, cut to length, barrel hoops of iron or steel, and hoop iron or hoop steel flared or splayed, shall pay $\frac{2}{10}$ cent per pound more duty than that imposed on the hoop iron or hoop steel from which they are made. Unenumerated articles of sheet, plate or hoop iron are unchanged.

Cast-iron pipe is placed at $\frac{1}{10}$ cent per pound, now 1 cent; enumerated castings $1\frac{2}{10}$ cents, now $1\frac{1}{2}$; malleable iron castings, not enumerated, $1\frac{1}{2}$ cents per pound, now 2 cents per pound; cotton ties 1 cent a pound, now 35 per cent. ad valorem; mill irons, cranks, forgings for vessels and engines and locomotives, $1\frac{8}{10}$ cents per pound, now 2 cents per pound; wrought iron and steel spikes, horseshoes, &c., $1\frac{1}{2}$ cents, now 2 cents; rivets and bolts $2\frac{1}{2}$ cents, now $2\frac{1}{2}$ cents; hammers, track tools, &c., $2\frac{1}{2}$ cents, now $2\frac{1}{2}$ cents; forgings, iron or steel, enumerated, $2\frac{1}{10}$ cents per pound, now $2\frac{1}{2}$ cents; wire nails above 2 inches 2 cents per pound, between 1 and 2 inches $2\frac{1}{2}$ cents, shorter than 1 inch 3 cents, now 4 cents a pound; horseshoe and hob nails and other wrought nails not enumerated, 3 cents a pound (now 4 cents). Boiler and other wrought tubes, 2 cents (now 3). Chains, not less than $\frac{3}{4}$ inch, $1\frac{6}{10}$ cents; not less than $\frac{1}{2}$, $1\frac{8}{10}$ cents; less than $\frac{1}{2}$, $2\frac{1}{2}$ cents (now $1\frac{1}{2}$, 2 and $2\frac{1}{2}$ cents respectively). Cross-cut saws, 6 cents per foot (now 8 cents). Mill saws, under 9 inches, 8 cents; over 9, 13 cents per foot (now 10 and 15 cents). Files under 4 inches, 30 cents per dozen; under 9 inches, 65 cents; under 14 inches, \$1.30; above 14 inches, \$2.25 (now 35 cents, 75 cents, \$1.50 and \$2.50 respectively). Cut nails, $1\frac{1}{10}$ cents per pound (now $1\frac{1}{2}$ cents). Cut tacks and brads, $2\frac{1}{2}$ and $2\frac{3}{4}$ cents, according to size (now $2\frac{1}{2}$ and 3 cents). Wood screws, 5, 7, 9, 11 cents (now 6, 8, 10 and 12 cents). Beams, angles, columns and building forms, $1\frac{1}{10}$ cents per pound (now $1\frac{1}{2}$ cents).

The following are the provisions of the bill relating to steel and to iron and steel rods and wire: Steel ingots, clogged ingots, blooms and slabs, by whatever process made; steel die blocks or blanks, billets and bars and tapered or beveled bars; bands, hoops and strips; steamer, crank and other shafts; wrist or crank pins; connecting-rods and piston-rods; pressed, sheared or stamped shapes or blanks of sheet or plate steel, or combination of steel and iron, punched or not punched; saw plates, wholly or partly manufactured; hammer molds or swaged steel; gun-barrel molds not in bars; alloys used as substitutes for steel tools; all descriptions and shapes of dry sand, loam or iron molded steel castings; all of the above valued at 1 cent per pound or less, $\frac{1}{10}$ cent per pound; valued above 1 cent and not above

4 cents per pound, 1 cent per pound, provided that nothing in this clause shall pay a less rate of duty than 45 per cent. ad valorem; valued above 4 cents and not above 7 cents per pound, $1\frac{1}{10}$ cents per pound; valued above 7 cents and not above 10 cents per pound, $2\frac{1}{10}$ cents per pound; valued above 10 cents per pound, $3\frac{1}{2}$ cents per pound, provided that on all iron or steel bars, rods, strips or sheets of whatever shape, other than the polished, planished or glanced sheet iron or sheet steel, hereinbefore provided for, and on all iron or steel bars of irregular section which are cold rolled, cold hammered or polished in any way in addition to the ordinary process of hot rolling or hammering, there shall be paid $\frac{1}{2}$ cent per pound in addition to the rates provided in this act, and on steel circular-saw plates there shall be paid 1 cent per pound in addition to the rates provided in this act for saw plates. The only change in the present schedule relating to iron and steel wire is the creation of a new class "not smaller than No. 5," which is to pay a duty of $1\frac{1}{2}$ cents per pound, and a provision for a 45 per cent. ad valorem duty on sizes smaller than No. 26, in place of the present duty of 3 cents per pound. In the case of steel not enumerated the present duty of 45 per cent. ad valorem is continued, with a provision that none of it shall pay a duty of less than $\frac{1}{2}$ cent per pound.

Lead ore and dross, $1\frac{1}{2}$ cents (now $1\frac{1}{2}$); pigs, bars and lead for remanufacture, $1\frac{1}{2}$ cents; sheets, pipes and shot, $2\frac{1}{2}$ cents (now 2 and 3 cents respectively).

Zinc, old, fit for remanufacture, $1\frac{1}{2}$ cents (now $1\frac{1}{2}$).

Nickel, crude and ore, 10 cents per pound on nickel contained therein (now 15 cents).

Type, $\frac{1}{10}$ cents per pound (now 20 per cent. ad valorem).

Hollow-ware, $2\frac{1}{2}$ cents (now 3).

Pens, metallic, 8 cents per gross (now 12). Gold pens (a new classification), 30 per cent. ad valorem.

Needles of all kinds, 25 per cent. ad valorem (knitting and machine needles are 35 per cent.).

Quicksilver, 5 cents per pound (now 10 per cent. ad valorem).

The following is a new section attached to the metal schedule: No allowance or rebate of duties for partial loss or damage in consequence of rust or of discoloration shall be made upon any description of iron, steel or other metal, or upon any article thereof, whether partly or wholly manufactured, or whether composed in whole or in part of iron, steel or other metal.

A recent issue of the *Railway World* says: "In view of the rapidly increasing demand for steel car-wheel tires, many of our patrons will be pleased to learn that arrangements are in an advanced stage for establishing new works with large capacity, and equipped with the best modern machinery and appliances, for the manufacture of steel locomotive and car-wheel tires. This important enterprise will be undertaken by a company with a cash capital of \$600,000, which will be under the general direction of Mr. Marriott C. Smyth, who was connected with the Midvale Steel Works for 21 years, and from 1873 until his resignation in 1887 was secretary and treasurer of that company. The site of the new works will be near Grapeville, on the main line of the Pennsylvania Railroad, about 27 miles east of Pittsburgh. It will possess, among other advantages, one of the best natural gas wells in the country, and it is in close proximity to the mines of the Penn Gas Coal Company and the Westmoreland Coal Company, so that if the natural gas should be exhausted cheap supplies of superior fuel can be readily obtained."

CORRESPONDENCE.

Our Future Bessemer Ore Supply.

To the Editor: The reading of the article on "The Dressing of Non-Bessemer Iron Ores," published in your late number, March 1, page 362, &c., is another indication that the attention of the steel manufacturing establishments seems to be turning to the great question of supply and demand of iron ores adapted to the Bessemer process, not only in our own country, but so far as is now known in the world. Specifically mentioned are five beds on the Atlantic slope which have been large producers of ores just adapted to this work. How near are some of them worked out? We are just in the infancy of steel making for the railroad system of this country and the world and nothing has yet been found to take the place of ores light in phosphorus for making Bessemer steel. It is quite certain that the visible supply of such ores is decreasing. Why? Because we used in only one year—the past one—over 5,500,000 tons of this variety of iron ores in the United States. The people in this country get a scare once in a while, which gives a set-back, doubtless; a good thing for all concerned. But does anybody think that a country increasing in population at the rate of over 2,000,000 souls a year and likely to contain 90,000,000 of inhabitants by the year of grace 1900 (only 12 years off) is likely to stop railroad building when half of the acreage of the country is from 40 to 50 miles from the nearest station. There are boys now living, and men, too, perhaps, who will live to see that the country has more than 300,000 miles of railroad tracks, and our annual requirement for renewals will exceed the present make of rails in this country. We grow too fast in some years, perhaps, did a little too fast last year, and yet wherever a new road has been opened the people cannot very well do without it. But all this train of thought brings us back to the question, Where are the iron ores adapted to the Bessemer process coming from? Will not the want of them set more men hunting for them? Will not some genius make an improvement on the basic process by which that system can be less expensive and more reliable? In the near future, more ores of this kind must be discovered or the prices be so much enhanced that with a lower duty proposed on steel rails American made rails may practically go out of use, unless a lower wage system is to prevail generally through the country, which no one ought to hope for. Yours very truly,

C. S.

OXFORD, N. J., March 6, 1888.

Referring in his annual report to the tunnel which is to connect Canada and the United States under the St. Clair River, the Minister of Railways at Ottawa says that the actual length of the tunnel will be 5280 feet, or one mile, of which 2310 feet will be under the river. For the center portion of this distance 1500 feet will practically lie on the level, the ascent from the center on either side being 1 in 50. The total length of the tunnel and its approaches will be 15,150 feet. The tunnel, cylindrical in form, will have a diameter of 20 feet in the clear. The greatest depth of water over the top of the work will be 40 $\frac{1}{2}$ feet and the minimum 15 feet.

Intimations come through the New York Real Estate and Builders' Exchange that overtures have come from labor leaders in Chicago for a general strike this spring in the building trades, but business is not remarkably good just now and in the light of past experience the suggestions thus volunteered are likely to have little effect.

TRADE REPORT.

British Iron and Metal Markets.

[Special Cable Dispatch to The Iron Age.]

LONDON, WEDNESDAY, March 14, 1888.

The situation in the Tin-Plate trade is becoming more serious. Between the slowness of sales, the inability of makers to agree upon any plan to sustain prices, and the loss in manufacture consequent upon the high cost of Block Tin, the financial resources of not a few concerns are severely taxed. The Abercarne Works, Newport, have stopped work, owing to the high cost of crude material, and their eight mills are now completely idle. The Tynewydd Works, Pontewydd, have also suspended and the company are reported to be in trouble financially. They operated two plate mills, producing the Usk, Ohio and Oak Coke Tins, and the R. P. and T. N. Crown Charcoals.

The Copper market has been influenced by the completion of a satisfactory agreement between English smelters and the French syndicate, the details of which do not, however, come to the surface. The advance in prices of Chili Bars consequent upon this has been partially lost the past few days under the influence of some anxiety to take profits on the part of outside speculative holders.

The Spanish Government have issued a decree forbidding the use of the open-air calcining process by the Spanish Copper mining companies. The companies now employing that process will therefore necessarily be obliged to reduce their output very materially. The output will be cut down about 25 per cent. between now and the 1st of January, 1889. Next year it will be reduced an additional 25 per cent, or to one-half the current production, and by January 1, 1891, the calcining process is to be done away with completely. The Government offer advantageous duties to make good the loss likely to be occasioned by the decree. There have been arrivals here the past week of 1150 tons American Copper Matte, and there is now about 3300 on the spot unsold.

There has been considerable talk pro and con on the matter of the alleged operations here and on the Continent by an American Lead syndicate. Current report is to the effect that this "ring" has control of most of the European production for three years, guaranteeing the producers £16 $\frac{1}{2}$ ton. Similar reports come to hand from Germany. No reliable information is imparted as to what part is taken by British producers in the arrangement. On the point of the date that the alleged arrangements goes into effect there is also a lack of satisfactory detail.

The Pig-Iron market has been rather quiet in all sections. Expectations with respect to export business are not realized, and it is the exception that the relation of home consumption and production is not decidedly adverse to any immediate change for the better.

Bolckow, Vaughn & Co. have secured an order for 30,000 tons of Steel Rails. The price is not reported. A "strike" of the workmen at the Gowerton Panteg Steel Works is threatened.

Financial.

OFFICE OF THE IRON AGE,
WEDNESDAY EVENING, March 14, 1888.

Our "special" arrived yesterday on the Pennsylvania Railroad, from a point a few miles beyond Newark, his first appearance since the great blizzard. He was storm-bound at Newark, in company with bankers, brokers and others who had been unable to reach New York. Trains on the Jersey Central and Lackawanna were expected to get through in a day or two; the tracks everywhere were obstructed by derailed locomotives. The business done in New York since Saturday night is practically nil. In financial circles the main point of interest was the status of the strike on the C., B. & Q., for, while it appeared that the road itself was not suffering greatly, there were reasons to fear that connections with other roads might be cut off, with serious consequences. Rate-cutting continued in the Northwest; nevertheless, railroad earnings up to the 1st inst. showed handsome gains over the same time last year.

The Stock Exchange markets were irregular. On Thursday stocks opened steady, but there was an immediate fall led by the coal shares, Union Pacific and the trunk line properties and the movement was feverish. The coal shares and stocks of Western roads were weak at the close. The report from London of the death of the Emperor William had no disturbing influence. On Friday there was a fractional improvement in the early trade. Then came a fall in Erie and in the coal shares and the movement was irregular and generally lower. Afterward weakness and strength alternated. The decline in Erie was caused by reports, declared by the president to be unfounded, of an unfavorable financial condition of the company. On Saturday New York and New England was freely sold in consequence of the unfavorable report for the quarter ending December 31, but the fall in this property did not have much effect upon the general list. On Monday and Tuesday business was virtually suspended.

The imports of merchandise were again heavy, but were \$1,000,000 below those of the previous week. The total valuation was \$10,908,000, of which \$3,000,000 represented dry goods. Since January the aggregate is \$98,870,000, against \$90,802,000 for the same time last year, and \$85,000,000 in 1886. The exports were \$5,709,086, making a total since January 1 of \$50,520,777, as compared with \$59,001,000 for the corresponding period last year and \$62,422,000 in 1886. According to the Custom-House report the exports of specie from New York last week were \$559,800, and the imports \$479,000. The totals since January 1 respectively are \$4,763,000 and \$1,481,000, against \$4,645,000 and \$3,655,000 for the same time last year.

The weekly statement of the New York associated banks showed a loss in surplus reserve of \$1,257,400. The excess of reserve is now \$11,487,300, which is \$3,488,950 more than at the corresponding time in 1887. The banks gained about \$500,000 during the week from the influx of currency, but the Government absorption of funds much exceeds the gain from interior operations. In specie there was a loss of \$917,400, while deposits showed an increase of \$608,400. There was an expansion in loans of \$1,696,800. The rates for money were about the same as those of the previous week, with a slight upward tendency. The banks were very cautious about time loans. Loans, running from three to six months on good collateral, were made at from 4 $\frac{1}{2}$ to 5 %, and on mixed collateral at from 5 to 5 $\frac{1}{2}$ %. The foreign exchange market was dull and steady at unchanged rates. The foreign demand for remittances for securi-

ties sold here on European account, which has been a feature of the market for several weeks past, continued.

Crushed by the blizzard, the various Exchanges have been almost a blank since Saturday night. Early in the week wheat speculation tended to stronger prices, on account of an alleged discrepancy in the Government statement, which showed 10,000,000 bushels in the hands of farmers, an amount far in excess of previous estimates, whereupon there was a decline in prices which stimulated heavy export buying. The shipments, as claimed, should have been 91,000,000 bushels, instead of 61,000,000 bushels, which would show a decrease of about 20,000,000 bushels, instead of an increase, as above remarked. The coffee market was depressed by adverse foreign cables. Provisions are stronger. It is feared that a number of carloads of live animals have perished in the cars.

The New York banks were lenient in dealing with paper falling due on Monday, at least in the case of the American Exchange Bank. There was no protest except as a formality, fees not being charged. As a rule, however, all paper was protested to avoid legal difficulties.

New York Market.

On Monday, Tuesday and to-day business has been entirely suspended through the effect of the storm, and even now only a few of those actively engaged in the Iron and Steel trade are at their places of business. Briefly summarizing the situation we may state that there has been nothing of any consequence in American Pig, that the only transaction reported in Spiegeleisen is a resale by an Eastern Rail mill to a Western concern of about 800 tons 20 $\frac{1}{2}$ at \$26.50. Bar Iron, Structural Iron and Plates remain unchanged, and no transactions of any consequence are reported in Steel Rails, which we quote at Eastern mill at \$31 @ \$31.50. Of Old Rails there was a sale of 200 tons of Double Heads on Saturday at \$21.50, with further quantities offered at that figure.

Louisville.

W. B. BELKNAP & Co., Louisville, report as follows, under date of March 12, 1888: The spring trade in this section is well advanced and has been satisfactory in volume. The demand is good for almost all staples, with an ample supply, unless it may be in the shape of Plain Wire, which, for the time being, seems commanding full prices and hard to get for immediate delivery in large quantities. The market lacks, however, a certain tone, which condition seems inseparable from steady or declining prices.

Bar Iron.—Large quantities of this being used, and going into immediate consumption, particularly among the Agricultural Implement men and in the various railroad and machine shops. Prices are low, though manufacturers are not disposed to give undue concessions. Hoops and Bands are dull.

Sheet Iron.—Is in fair demand for both heavy and light gauges of Sheet. Prices are steady and seem likely not to go lower during the season.

Nails.—Since the advance in Wire Nails, which seems to be well maintained by the majority of manufacturers, Cut Nails have taken a little courage, and there is no variation to speak of from established Wheeling prices.

Wire.—As intimated above, Wire is the one article on the list that has a stiff backbone, and there seems to be no surplus stock to supply what is rather an urgent demand. Both Plain and Barbed have advanced over the lowest figures, and that seems to be a good promise of their holding what has been gained.

Hardware.

The severity of the storm which began on Sunday night and prevailed with little abatement during Monday and Tuesday has had the effect of putting an almost entire stop to business. Many of the stores were not opened on Monday, and those that were found only a fraction of their force on hand and no business to do, and closed early in the afternoon that there might be an opportunity for the difficult and uncertain task of returning home through the storm. Tuesday found the conditions substantially unchanged, no mails, the railroads stopped and streets blocked, with an almost unprecedented depth of snow, the removal of which from roofs and sidewalks was promptly taken in hand. At this writing (Wednesday afternoon) the trains from all quarters are still snowed in, no mails having been received since Sunday night. Trade is consequently at a standstill, with the exception of the local demand for Snow Shovels, of which the stock is already broken, and for Shovels and Scoops, which are called for especially for use on the railroads. In this condition of things there is little new to report in regard to Hardware. The principal features of the situation are given below.

SCREWS.

The stocks of Screws purchased at low prices and held by the jobbers have very generally gone into consumption, and many of the merchants who have been offering Screws at cut prices are under the necessity of replenishing their stocks at existing quotations. The result has been an evident strengthening of the market, which is thus becoming free from the demoralization which has characterized it for a long time. The Screw manufacturers also who have been waiting for the absorption of the old stocks are taking advantage of the present condition of things, and, without the announcement of any advance in prices, are showing a disposition to withdraw extras and to hold the goods as nearly as may be at circular rates. The result is a perceptibly improved tone in the market, with the prospect that prices are to be more regularly maintained in the future.

NAILS.

A meeting of the Western Nail Association was held in Pittsburgh on Thursday, the 8th inst. Representatives were present from Wheeling, Bellaire and the West. During the meeting it was developed that stocks were lower than for some months, while a considerable improvement in demand was reported. It was decided to advance the card to \$2.10, less 10 cents in carload lots, with 2 per cent. off for cash. This is the first meeting of the Nail manufacturers held for some months, and while it is not probable that the advance of 10 cents in the card rate will be looked upon by the trade with much reliance, in view of the little attention paid to the card rate by the manufacturers in the past, still the advance may be taken as an indication that the manufacturers have a more hopeful view of the future. Another meeting of the association will be held at Pittsburgh on Wednesday, April 11, next.

The Laughlin Nail Company, of Wheeling, W. Va., announce under date of March 1 that they have secured the services of George G. Spencer as general salesman, with headquarters at 115 Dearborn street, Chicago.

BARB WIRE.

A number of meetings of Barb-Wire manufacturers have been held lately, the first occurring in this city on the 24th ult., the Cambria Iron Company, of Johnstown, Pa.; H. B. Scutt & Co., Limited, of

Pittsburgh; the Southern Wire Company, of St. Louis; the American Wire Company, and the St. Louis Wire Mill Company all being represented. This was followed by a second meeting at Joliet on March 1, of the following manufacturers located at that point: Watkins Barb Fence Company, Shreffler & Van Fleet, Joliet Enterprise Company, Joliet Barb Wire Company, Ashley Wire Company, H. B. Scutt & Co. and the Lambert & Bishop Wire Fence Company. At both meetings it was decided to agree to advance prices 2½ cents for Painted and 4 cents for Galvanized, f.o.b. Joliet or Chicago. Since then the following manufacturers, not represented at this meeting, gave their assent to the action taken, agreeing to maintain the prices named: Omaha Barb Wire Company, Omaha; Iowa Barb Steel Wire Company, Marshalltown, Iowa; Baker Wire Company, Des Moines; Northwestern Barb Wire Company, Sterling, Ill.; Indiana Wire Fence Company, Crawfordsville, Ind.; and the Superior Barb Wire Company, of De Kalb, Ill. This action grew out of the conviction among manufacturers that their product was selling at too low a price, and that a slight advance must be obtained. It is stated that all the concerns on an average have more business on hand at the present time than they can take care of for at least 30 days, and the feeling was general that new sales should only be made at the higher price named. It is stated that this is not an ironclad agreement, nor are all the manufacturers west of the Allegheny Mountains included in these named; still their output does represent fully 90 per cent. of the total make of Barb Wire in that section.

ITEMS.

The Empire Wringer Company, Auburn, N. Y., are putting on the market a new Wringer named the Volunteer, in which they have embodied many of the best features of other styles. Among the advantages to which they call attention are: The single long-precision screw, which is described as adjusting rolls in one-half the time required when two are used; the fact that the bearings of the rolls are made of hard maple, which is thoroughly saturated with tallow, thus requiring no oiling, and, being clean, never greasing the clothes. The iron parts are galvanized, the rolls being of solid white rubber made upon and vulcanized to the shafts. The improved wood clamps are made to fit round or square tubs of any thickness, as may be ordered. The Wringer is made with the grasshopper spring, which is referred to as giving great capacity when large articles are wrung. The wood frame is hard maple, thoroughly seasoned and finely finished.

Bridgeport Chain Company, Bridgeport, Conn., issue a catalogue and price list of the line of Sash Chains, Patent Wire Chains, Dog Chains, Plumbers' Safety Chains, &c., which they are manufacturing. They call special attention to the quality of these goods, alluding particularly to their Triumph Wire Chain as being especially handsome and strong.

Morley Bros., East Saginaw, Mich., have just commenced the manufacture of Ox Bows made from second growth hickory, making a specialty of Wisconsin and California patterns. They refer to their situation near the finest growth of hickory timber as giving them the best facilities for turning out these goods.

Announcement is made, Chicago, March 7, that R. B. Tuller, who was for some time prominently connected with the old firm of Pribyl Bros., has become associated with Horton, Gilmore, McWilliams & Co., who have also secured control of the Union Cutlery Company brand, formerly controlled by Pribyl Bros., and of which it is stated that they will as rapidly as

possible place on the market an entire new line of patterns of special quality. They have also engaged the services of M. M. Levison, who is referred to as well known to the cutlery trade of Chicago and the West, and who has been until recently also with Pribyl Bros. With the reorganization of their house they are putting their Cutlery department in the front line, and allude to the extent and quality of their stock. Their price current, dated March 7, relates to Metals, Tin Shingles or Tiles, Indurated Fibre Ware, Wire Goods, Refrigerators, Steel and Wood Goods, Lawn Mowers, &c.

It will be seen that Haydock & Bissell, 12 Murray street and 15 Park Place, New York, announce, page 49, a large and peremptory trade sale of Table and Pocket Cutlery, Cast Steel Shears, Plated Flat Ware, &c., comprising large and desirable invoices direct from the manufacturers and importers. This sale is deserving of special attention as it will include a large line of desirable patterns of first quality discarded numbers of Table Knives and Forks.

The Sagamore Mfg. Company, Valatie, N. Y., issue circulars relating to their new Anti-Friction Washer Jack Screw, Hitching Weights and improved Wagon Shoes. They also announce that they are prepared to contract for the regular supply of Iron, Brass and Bronze Castings of all descriptions, and allude to their facilities for turning out such work.

The Hitchcock Mfg. Company, Cortland, N. Y., have issued their 1888 catalogue. In their opening greeting they give figures showing the number of Cutters manufactured by them during the past ten years, increasing from 125 in 1878 to 20,000 in 1887. They mention that their trade in Buggies and Spring Wagons has increased in more than the same ratio, and they state that for the present year they expect their output will be 20,000 Cutters and 10,000 Buggies, Spring Wagons and Carts. The catalogue represents some of their leading patterns in these lines.

The Fred J. Meyers Mfg. Company, Covington, Ky., issue a circular devoted to their Galvanized Wire Fish Traps, of which three sizes are made: 36 inches long, 30 inches deep, 24 inches wide; 48 inches long, 24 inches deep, 20 inches wide; and 60 inches long, 28 inches deep and 34 inches wide.

HARDWARE IN CHICAGO.

The Hardware jobbers of Chicago have enjoyed an exceptional season of prosperity during the past 12 months and more. It is true that in that time one large house (Keith, Benham & Dezendorf) fell out of the ranks and discontinued business, but it did not fail, and its stock was readily absorbed by other members of the trade, who were able to dispose of it without affecting the regular course of prices or creating any interruption to the general harmony. Improvements are naturally the order of the day, while some firms are seriously contemplating the enlargement of their quarters to accommodate their increasing business.

Hibbard, Spencer, Bartlett & Co. are putting in an Edison incandescent electric light plant, to operate lamps in every part of their extensive building from cellar to attic. It will be an independent plant, including engine and boilers. An Ide engine will be used, and two dynamos will be run capable of operating 600 lights, almost that large number being needed to supply the various departments. Their system of fire protection is also being extended. They now have an automatic fire alarm in the office, but this is to be continued throughout the building. They will also put up stand-pipes and ladders outside the building at proper intervals for its entire length.

A. F. Seeberger & Co. have recently added a new department to their store, now carrying a full line of Sporting Goods, such as Guns, Fishing Tackle, &c. This new departure, in connection with an increase in their general business, has rendered it necessary for them to have more room, and they hope shortly to secure the second floor of their building, which has been long occupied as a salesroom by Rathbone, Sard & Co., stove manufacturers. Messrs. Seeberger & Co.'s establishment was located on the corner of Lake and State streets, where the crockery house of Pitkin & Brooks now stands, for eight years before the fire of 1871. After the fire they removed to their present location, a few doors east, as soon as the building was ready for occupancy, and Rathbone, Sard & Co. went there with them, continuing until now. With the occupancy of the second floor Messrs. Seeberger & Co. will then have possession of the entire building for their business, embracing five stories and a basement, and giving them admirable facilities in every respect.

The Wells & Nellegar Company state that they have enjoyed a very good year's trade, having succeeded in keeping a very large part of the patronage of Keith, Benham & Dezendorf. Notwithstanding the adoption of all kinds of expedients to economize room they are finding themselves cramped severely in their present quarters. A glance in their main room on the ground floor is evidence of this fact. Every inch of space is utilized on floor and wall for sample cases and samples, while a gallery has been erected along one side of the room for relief. They are looking forward to a still better trade in the future.

Horton, Gilmore, McWilliams & Co. are also handling an immense business for their present facilities. Almost the whole of the main floor is now given over to the packers, who threaten to invade the offices soon if not given an outlet in some other direction. As far as possible goods are being shipped from upper floors in original packages without entering the regular packing department, but very little relief has been secured in that way.

Markley, Alling & Co. feel the impulse of good trade along with their competitors and are enjoying their full share of the business which keeps rolling toward Chicago.

OBITUARY.

The Lalance & Grosjean Mfg. Company, New York, under date March 8, make the following announcement of the death of Alfred E. Grosjean, to which we alluded in our last issue.

At a special meeting of the Central Stamping Company, called by order of the president, March 9, the following resolutions were adopted relative to Mr. Grosjean's death, and were engrossed on the records of the company by order of the board:

It is our painful duty to announce the death of Mr. Alfred E. Grosjean, only son of our president, an officer and director of this company, who was drowned a few days since in one of the lakes of Florida. The deceased was a young man of rare ability, sterling integrity, genial nature, generous disposition and kindness of heart. His many excellent qualities commanded the respect and won the esteem and admiration of all who knew him. The loss, so seriously felt by his relatives and associates, will, we are sure, enlist your sympathy also.

Whereas, Death has suddenly separated from us Mr. Alfred E. Grosjean, our youngest director,

Resolved, That, humbly bowing and acknowledging the Almighty, in whose hand are all our lives, we here express our sorrow at this affliction.

Resolved, That we here record our appreciation of the manly character of our dear friend, whose vigorous young life had opened with

such exceptional promise of a brilliant and useful future.

Resolved, That we offer to his family our sympathy in this, our common sorrow, and that, closing our business, we attend the funeral and pay our sad tribute of love and respect together.

TRADE TOPICS.

The following expression of opinion given by some of the leading Hardware men of Chicago, in regard to the proposed revision of the tariff, will be of interest:

James M. Horton, of Horton, Gilmore, McWilliams & Co.: "I have thought very little about the proposed tariff measure—in fact, we could adapt ourselves to any condition of the tariff with proper notice. The only thing to be feared, in my mind, if this bill were to pass, is the demoralization of business which would be caused by those who would be affected by the reduction proposed. I am not in favor of putting tin plates on the free list, however, and think it unwise to do so at present, although, as a general thing I am in favor of low duties, but just now it looks as though we would shortly develop a tin industry in this country which would lead in the course of time to the manufacture of tin plates on this side of the Atlantic."

A. C. Bartlett, of Hillard, Spencer, Bartlett & Co.: "The tin plate provision in the Mills tariff bill is very acceptable, and I see no reason why the duty should not be taken off. I have only examined that part of the bill relating to matters in which we are interested, so that I can say but little about the bill generally. It would kill the cutlery trade in this country, however, to have the reduction made which is proposed. At the present rate of duty our cutlery manufacturers have all they can do to meet the competition of foreign manufacturers, and yet the interest is a large and important one. So far as razors are concerned, the reduction, I think, would make very little difference. I approve of the proposed reduction on sheet zinc, in which I think the advantages to the country ought to outweigh the benefit received by the few manufacturers who are running their establishments under the present tariff. It would be no damage to this country to have sheet zinc come in free. In general, however, I believe in keeping duties up to protect the manufacturing interests of this country whenever the price of labor would be affected by a reduction."

Robert M. Wells, of the Wells and Nellegar Company: "I think the tariff ought to be revised, but am not prepared to say that this bill embodies my ideas. The duty on tin plate could very properly be taken off, as none is made in this country, and on some classes of cutlery also duties could be reduced."

A. F. Seeberger, United States Collector of Customs and senior member of the firm of A. F. Seeberger & Co., wholesale Hardware dealers: "As a Democrat, I welcome this bill as a step toward the removal of duties which are now largely unnecessary. I am in favor of the removal of the duty on tin plates and the other reductions proposed in the metal schedule. My official position has enabled me to observe very critically the incongruities in the present tariff, and the only hope of remedying them that I can see is in reducing duties. I am sorry this has become a partisan question, as that will affect its chances of passage, which now seem to me somewhat involved in doubt, owing to the attitude of a few Democratic Congressmen, who may unite with the Republican Congressmen to oppose it. The question is one purely of business and should not be made one of party politics."

J. N. Raymond, President Raymond Lead Company: "On general principles I believe protection is for the best interests of

the country, and so I am not in favor of the bill. I do not believe the country wants any change made in the tariff. The West is not developed enough yet for any agitation on this subject of reducing duties. We have a big country out here and its interests have as yet been very imperfectly built up. Protection has made this country what it is, and not free trade, and we are in favor of continuing it."

Relating to the keeping of catalogues and lists, and the inconvenience suffered from the diversity in size and form, we have the following from a Hardware house on the Hudson:

"We appreciate the remarks about keeping catalogues and lists. For this purpose we have a case 4 feet long, 13 inches high, with pigeon-holes 12 inches deep, 7½ inches wide and 6 inches high. The greatest annoyance comes from the irregularity in the size of lists. We think if all the trade who issue catalogues or price lists would make 9 x 6 inches a standard size it would be a satisfactory arrangement. As we look at our case now we have one pigeon-hole that has catalogues varying in size from 4½ x 3½ to 11 x 7½ inches. You can easily see what a mixed lot it is, and how easy it is to overlook one of the smaller ones. As to issuing lists they seem to be printed on the size of paper the printer happens to pick up. The only proper way out that we know of is for every merchant to have a lot of manila slips 9 x 6 inches, and when he gets a circular to pin or paste it fast, and then file these sheets alphabetically. Reform is certainly needed."

SOUTHERN TRADE.

We print below a review of the former Southern jobbing business of this city, with reference to the methods of business and the houses prominent in the trade more than a generation ago. These recollections furnished by one who was at that time identified with the trade will be of interest:

The palmiest days of the Hardware jobbing trade in New York City were prior to the war. Competition then was not so keen as at present, and as business was conducted on a less expensive basis, and the margin of profit was large, especially on imported goods, which entered very largely into the sales, many of those engaged in business realized fortunes, among whom may be mentioned Coffin, Bruce, Bishop & Co., William Bryce & Co., Bruff Bros. & Seaber, Ingoldsby, Halstead & Co., and Wolfe, Gillespie & Co., all excepting William Bryce & Co. now out of business. Fully 80 per cent. of the goods sold were imported, and the profit on some of these was enormous compared to the percentage realized at the present day. For example, Pocket Cutlery, Hand Saws, Files and other shelf goods paid 50 to 60 per cent; plantation supplies—viz., Hoes, Traces, &c.—25 per cent., while on leading goods, such as Nails and Shot, there was a margin of 10 per cent. Most of the houses also had side lines of notions Stationery, &c., which paid a margin of 75 to 100 per cent. Goods were sold on long time, nominally six months, but accounts were usually settled once a year, when the crop was harvested, and if the crop proved short the account was extended with interest. Drumming for trade was then an unknown method of extending business, and during the two regular seasons—spring and fall—when, as a rule, the customers visited the city, they bought from their favorite houses without solicitation. Those who were connected with the trade at that time (especially if doing a Southern business) will recall how, during the seasons mentioned, the customers flocked in so numerous that the force was often inadequate to the task of waiting upon them all.

Customers usually combined business with pleasure, and spent considerable time in the city.

Fully 90 per cent. of the Southern shipments were made by sail, one or two regular lines of sailing vessels running to each of the principal ports, there being but one line of steamers to Charleston, and one to Savannah and one to New Orleans. Purchases were made in a leisurely manner compared to the rush and energy of the present day, and the utmost good feeling existed between the jobber and his customers. The goods being some time in transit after the purchase, the customers were in no hurry to return home, giving the jobbers an opportunity to become well acquainted with their trade. The manufacturer then sold exclusively to jobbers in the large cities, making no effort to reach the retailer, or even the smaller jobbers of the larger towns, and as a rule were run to their full capacity. Such houses as Williams & Price, of Charleston, John Dawson and Geo. Peck & Co., of Wilmington, N. C., all leading merchants of their towns, purchased from jobbers. The writer remembers each of the above and many others, all of whom are now dead, and recalls especially the genial Uncle John Dawson, who died only a few years ago at an advanced age beloved by all who knew him. He was succeeded by W. E. Springer, who had formerly been in his employ.

Of course the beginning of the war ended this state of affairs. A number of the jobbers retired from business, but on the conclusion of the war they endeavored to resume relations with the South. They encountered, however, an element before unknown to them—viz., the enterprising Northern business men, who, having emigrated to the South and located in various States, were prepared to compete with the older houses for the trade. Goods were offered at as low, and sometimes at lower, figures than were quoted by New York houses, and as orders were executed with much less delay these men have so far succeeded in their efforts as to leave but one exclusive Southern jobbing house in New York City at this writing. The jobbing houses of the Southern States have grown enormously, while such houses as Coffin, Lee & Co., Sherman Bros., Sheldon, Hoyt & Co. and Samuel Roosevelt & Son and others, who formerly controlled the Southern trade in this city, have ceased to exist.

One of the many things that have operated against the New York jobbers has been the disposition on the part of the manufacturer to discriminate against them in the delivery of goods at distant points for the same prices as for delivery in New York. This often enables the retailer to purchase from the near-by jobber at the same price as in this city, and the saving in freight on heavy goods, such as Axes, Nails, Shot, Shovels, &c., is quite an item. The retailers of the South are, as a rule, as sharp as those in any other section, and all these items are looked after and saved when possible. Case after case can be cited where New York quotations for heavy goods have been met with the remark, "I can do as well in Atlanta, St. Louis, or some other place, and save my freight," and unless concession is made the sale has been lost. This concession has frequently been the entire profit on the transaction.

The establishment of purchasing agents by the larger retailers has also operated against the jobbers. These agents being always in the market are enabled to buy many, if not all, their goods at manufacturers' prices, and are quick to take advantage of any break in the market on any leading item. The disposition on the part of the New York jobbers to grant long indulgences to their customers has been the principal reason why a portion of the trade has been retained so long, but through

the keenness of competition the margin of profit has been cut so low that it has become unprofitable, and the jobbers have gradually withdrawn from the business. There is some good trade still coming to this market, but it is limited in comparison with the magnitude of the trade before or immediately after the war, and it is growing less every year.

ARRANGEMENT OF HARDWARE STORES.

In the store of E. R. Strong, Fort Atkinson, Wis., of which we hope soon to

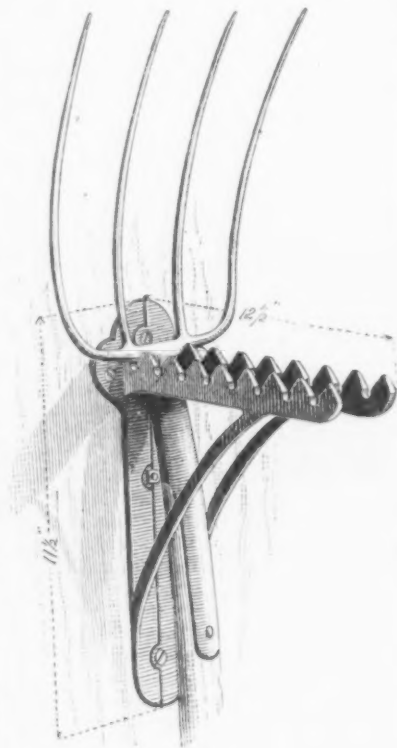


Fig. 202—Fork and Shovel Bracket.

give a further description, there is in use a novel method of accommodating Forks, Shovels, &c. For this purpose brackets designed and patented by John N. Hager

brackets arranged for the accommodation of different kinds of goods for which they are adapted, and showing the use to which they are put in Mr. Strong's store, where in a space of 8 1/2 feet wide there are 19 brackets on which can be displayed 152 different articles, such as Forks, Scoops and Shovels, both long and D handled, also Rakes, Spading Forks, Hay Knives, &c. The brackets, Fig. 202, are made of malleable iron in two parts, fastened together on a back plate with lugs or ears to keep them from spreading. They are attached to the wall by four screws. The size of the brackets is 11 1/2 x 12 1/2 inches. The arms are 12 1/2 inches long, with notches on the top to keep the goods from turning sideways and dropping to the floor, as they are liable to do with common hooks and Brackets. With these brackets they are described as held so steadily that it is not necessary to have a stay below for the Long-Handled Tools, which can be hung on any part of the bracket without any liability of falling. These brackets have been in use in Mr. Strong's store for more than six months, and are highly commended on account of their convenience and utility. The points of advantage mentioned are: They are very economical of space; exceedingly convenient in use; make an effective display of the goods; keep the stock in good shape; that the merchant keeping the goods by this method can always tell at a glance what there is in stock. Fig. 203 shows the manner in which they are put up, the upper row being 7 1/2 feet from the floor and the lower row 4 feet from the floor. The brackets are placed 9 inches apart for three-tine Forks, 10 inches for four-tine Forks and 11 inches for five or six tine Forks. J. N. Hager, the patentee, is manufacturing the brackets, which are furnished drilled and japanned at \$6 per dozen pair.

CONDEMNED SAWS.

It is well known that the manufacturers of Circular, Cross-Cut and other long Saws have suffered a good deal of inconvenience and injury on account of the return to them of Saws which are referred to by the purchaser as too hard or soft, or otherwise defective, when as a matter of fact the Saws are all right and not open to the objection

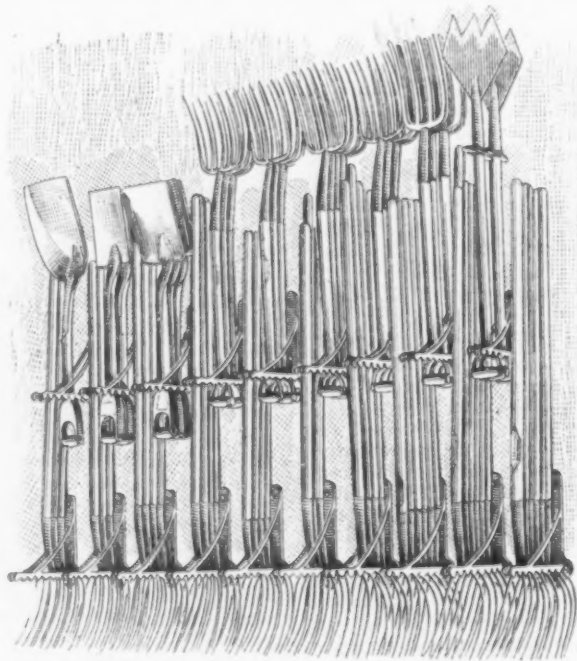


Fig. 203.—Method of Using Fork and Shovel Brackets.

are used, the construction and arrangement of these brackets being illustrated in the accompanying cuts. Fig. 202 represents a single bracket and Fig. 203 a number of

made against them. The merchant who has sold the Saw is usually reluctant to make any objection against taking it back, especially as the manufacturer will in nearly

all cases receive it and furnish another in its stead. This is a matter which is annoying to the retail merchant and the jobber from whom the Saw has been purchased, as well as to the manufacturer, who has to bear the principal burden of the practice. Relating to this matter we print below the following circular which explains itself. It is of special significance as showing the large proportion of good Saws which in the case referred to were returned, and we presume that nearly as large a proportion will be found in most lots similarly sent back to the manufacturers. We doubt not that many dealers and manufacturers generally will appreciate the thoughtfulness of Foster, Stevens & Co. in issuing this circular, endeavoring to check the abuse and facilitating discussion of the question.

GRAND RAPIDS, Mich.,
February 4, 1888.

On the 1st of January we returned to different manufacturers the condemned Saws that we had on hand. We print below an extract from a letter received by us from one of them, and think it of enough importance to call your attention to it. We think the practice of taking back any and every Saw just because a man says it is poor all wrong, and an imposition on the manufacturer as well as the retailer and jobber. How can the taking back of good Saws be stopped? That is the question. We would like to have your opinion. We have one customer who has traded with us for 20 years, whose purchases of Cross-cut Saws average about 25 to 50 each winter, and during this long time he has never returned a Saw. Why? He sometimes takes a Saw back, but on examining it finds it a good one and sends it out again, and nine times out ten of it never comes back. We hope you will assist us in correcting this great abuse. Respectfully,

FOSTER, STEVENS & CO.

MESSES. FOSTER, STEVENS & CO., Grand Rapids, Mich.—*Gentlemen:* We have received and carefully examined the Cross-cut Saws returned. They were first examined by our man who always does this kind of work and is regarded as an expert, and he reports 24 defective Saws out of 183 returned.

We have at the present time with us a man who was formerly in the Saw business, but for the last eight or nine years has been engaged in the Timber business and handling of Saws, and keeping them in order, in the Michigan pineries. We turned the entire lot over to him, after erasing the marks that had been put on them by our regular tester, and requested him to give them a thorough examination and mark them according to his opinion. He makes the following report:

Good Saws that ought not to be condemned, 165
Saws that are too soft, 14
Saws that are too hard, 4

Of the good Saws he has made a division as follows:

Saws that are up to the very highest standard of temper, 81
Saws that vary from this one way or the other slightly, but not sufficiently to be returned under warranty, 84

You will see from these figures that there has been considerable looseness on the part of dealers in taking back Saws. We know that it is impossible for you to control this matter entirely, but trust that you will assist us in educating the dealers up to a more strict construction of the warranty. * * * Awaiting your early reply, we are yours truly, * * *

Writing on this subject a Hardware house in a recent letter says:

This matter has been a source of much trouble with us. We cannot tell positively when the Saw is brought back to us and the party returning it says it is too soft or too hard whether or not this is the case. If, believing the party is mistaken, we refuse to exchange with him, we lose a customer.

We lay this whole matter before the trade that it may receive their careful attention. It rests largely with the retailers to correct this abuse and to be careful, as they are exceedingly careful, in taking back Saws as defective.

Metal Market.

Copper.—Since Monday morning business has been practically suspended at the Metal Exchange and throughout the trade, so that our record carries us only until Saturday last, the only exception being the reports from the other side, which have come in quite regularly. Chili Bars opened on the 7th inst. at £81. 5/, remaining at that figure on Friday, but coming lower on Monday at £80. 2/6, closing to-day at £81. 7/6. This market was quiet on Thursday, Friday and Saturday, it being claimed that spot and March was not available at less than 16.40¢, while April and May was held at 16.45¢, and a single transaction of 25,000 pounds was made on Saturday at 16.60¢ for June. It is claimed that the bulk of the Copper is held in strong hands here, and that the speculative element at the Cotton and Coffee Exchanges has not yet covered its shorts, for which time is available until April. It is now generally reported and believed that with the exception of the Stanton group of mines, the Atlantic and Central, all the Lake Superior Copper companies have joined in the French pool.

Tin.—The market in London has remained steady throughout at £166 for spot, but futures have declined from £142 on Thursday to £140 on Friday, £137 on Monday and £130 to-day. It is stated that Mr. Strauss has opened an active bear campaign. Here at the close of the week, under comparatively heavy business, the market fell about 1¢ per lb. On Monday it closed at 36.50¢ bid and 37¢ asked for spot, 35.20¢ asked for March, 32.95¢ for April and 31¢ for May. **Tin Plates.**—At the close of last week the Tin-Plate market was the same as described in our previous report. This week, through the force of circumstances, there has been no business doing in New York, and if anything remarkable has happened elsewhere, we are in ignorance of it. We repeat last week's quotations for large lots in New York as follows: Siemens-Martin Steel, Charcoal finish, \$5.10 @ \$5.30, ditto, Coke finish, \$4.90 @ \$5; Ternes, \$4.20 @ \$4.30; Bessemer Coke, \$4.70 @ \$4.75, and Wasters, \$4.62½.

Lead.—Throughout the week the market has remained very quiet, weakening on Saturday under comparatively large sales at the Exchange, with spot about 5.17½¢ to 5.20¢.

Spelter.—This metal has continued very dull, and has shown weakness, closing at 5¢ @ 5.25¢ for Common domestic.

New York Metal Exchange.

The following sales are reported:

THURSDAY, March 8.	
100,000 lb Copper, April.....	16.35¢
100 tons Lead, May.....	5.22½¢
100 tons Lead, September.....	5.25¢
FRIDAY, March 9.	
50,000 lb Copper, April.....	16.35¢
125,000 lb Copper, May.....	16.45¢
25,000 lb Copper, Sept.....	16.30¢
10 tons Tin, April.....	33.05¢
10 tons Tin, March.....	35.10¢
30 tons Tin, March.....	35¢
10 tons Tin, April.....	32¢
SATURDAY, March 10.	
25,000 lb Copper, July.....	16.20¢
116 tons Lead, May.....	5.20¢
16 tons Lead, May.....	5.22½¢
16 tons Lead, June.....	5.17½¢
100 tons Lead, June.....	5.17½¢
100 tons Lead, July.....	5.15¢
MONDAY, March 12.	
16 tons Lead, June.....	5.15¢

Coal Market.

The Coal trade is temporarily suspended on account of the impossibility of making deliveries. In the harbor on Monday no Coal was moved, but thereafter less difficulty was experienced. The steam companies and other large consumers have adequate supplies on hand. The An-

thraxite market is dull and easy. All the companies have put out their spring circulars, as quoted in this column last week—viz., Wyoming free burning, f.o.b. at South Amboy and Weehawken, Broken or Grate, \$3.75; Egg, \$4; Stove and Chestnut, \$4.25. Reading Hard White Ash, at Port Elizabeth, is: Lump and Steamboat, \$4.50; Broken, \$4; Egg, \$4.10; Stove, \$4.25; Chestnut, \$4.15; Pea, \$3. Free White Ash is the same, except Broken, \$3.75, and Egg, \$4. Among fancy Coals, Lykens Valley is: Broken, \$4.75; Egg and Chestnut, \$5.25; Stove, \$5.15. Schuylkill Red Ash, is: Egg, \$4.25; Chestnut, do.; Stove, \$4.75.

No statistics of production for the week have as yet come from the mines. A Hazelton dispatch says the strike has been "declared off," but no further information is at hand in this city, as Coal cannot be moved at present.

Bituminous Coal is \$3.25, f.o.b.

Imports.

Hardware, Machinery, &c.

Bawo & Dotter, Hardware, cs., 5
Baker, Hermann & Co., Arms, cs., 9; Mdse., cases, 5
Bi ch Bros., Mach'y, pkgs., 39; Cylinder, 1
Clark G. & Bros, Mach'y, cs., 80
Curley, J. & Bro., Cutlery, cs., 2
Degrauw, Aymar & Co., Cables, pkgs., 24
Dodge Mfg Co., pkgs., 6
Field, Alfred & Co., Mdse., cs., 15
Fleischman & Co., Mach'y, cs., 1
Folsom, H. & D., Arms, cs., 5
Gray Cutlery Co., Cutlery, cs., 19; Haw., cs., 2
Henderson, Bros., Mach'y, pkgs., 1
Irvin, John, Mach'y, pkgs., 3
Inhauser, —, Mach'y, cs., 3
Jacobus E. G., Crank Pins, 40
Jackson, W. H. & Co., Files, cs., 7
Jennings, A. G. & Sons, Mach'y, cs., 1
Kastor, A., Mdse., cs., 2
Knobel & Co., Hwd., cs., 3
Lambertson & Co., Arms, cs., 1
Lau, J. H. & Co., Cutlery, pkgs., 3; Arms, cs., 3
Meyer, Geo. A., & Co., Machines, cs., 6
Oastler, W. C., Mach'y, pkgs., 11
Oulerbridge, A. E. & Co., Propeller, 1
Pratt & Farmer, Hdw., cs., 4
Sanderson & Son, Mach'y, pkgs., 38; do., cs., 2
Schoverling, —, Arms, cs., 18
Schoverling, Daly & Gales Hdw., cs., 6
Sheldon, G. W. & Co., Mach'y, pkgs., 1; do., cs., 8; Cutlery, cs., 5
Schloss & Sons, Mach'y, cs., 5
Schwartz & Co., Mach'y, cs., 7
Stoddart, Lovering & Co., Mach'y, cs., 3
Taylor, Messrs., Hardware, cs., 6
Ward, A-line, Cutlery, cs., 2
Wiebusch & Hilger, Lim., Mdse., cs., 16; Hdw., cs., 4; Chains, cs., 20
Order: screws pkgs., 7; Mach'y, Cutlery and Hdw., pkgs., 19

Julian Kennedy, who recently resigned his position as general superintendent of the Homestead Steel Works of Carnegie, Phipps & Co., Limited, at Homestead, Pa., has accepted the position of manager of the Allegheny Bessemer Steel Company, of Pittsburgh. This is the concern which has purchased the plant of the Duquesne Steel Company, at Duquesne, Pa., and will turn it into a rail mill. A charter was granted to the company on the 7th inst., and \$700,000 is named as the capital stock. It is expected the plant will be ready to commence operations about July 1 next.

John Stambaugh, one of the foremost citizens of Youngstown, Ohio, and president of the Brier Hill Coal and Iron Company, of that place, died in New York City on Monday, the 5th inst., of acute pneumonia, aged 62 years. Mr. Stambaugh went to New York about a month ago for the benefit of his health, and while there contracted a cold which developed into pneumonia. His wife and four children survive him.

A press dispatch from Dubuque, Iowa, dated the 7th inst., states that in the case of the Washburn & Moen Barb Wire Company vs. The Beat-Em-All Barb Wire Company, of Cedar Falls, the plaintiff has filed an appeal bond in Judge Shiras's Court.

Foreign Markets.

EQUIVALENTS.

	Cents.
Franc (Switzerland) Lira.....	10.3
Florin (Netherlands).....	40.2
Florin (Austria).....	35.9
Witels (Portugal).....	1.8
Mileis (Brazil).....	51.5
Mark (Germany).....	23.8
Kilogram.....	2.3
Picul.....	134

EAST INDIES.

SINGAPORE, January 31, 1888.—Tin.—Sales reported during the interval amount to 400 tons, between \$55.25 and \$53, the closing price being \$53.87½. Supplies have not been very plentiful, and the stock in dealers' hands is not large. Shipments will probably amount to 3000 tons, the whole of the stock held in shippers' hands having gone forward. **Tonnage.**—Steamer rates to London are steady at 32/6 to 35/ for weight. For New York the S. D. Carlton and Carl Both are loading. Both are about fully engaged. Nominally rates are unchanged. **Exchange** is quoted 3/2½ for six months' sight credits.—*Gilfillan, Wood & Co.*

PENANG, January 24, 1888.—Tin.—Receipts during the fortnight amounted to 50,500 piculs, of which 10,500 were taken for Europe and 4000 for China. There has been an active business doing, the market opening a fortnight ago at \$55.93, and gradually rising to \$56.75. Toward the close the fluctuations in exchange caused some irregularity and weakness, bringing about a decline to \$53, at which some more business was done both for Europe and China. Since January 1 19,754 piculs were shipped to London and nothing to the Continent and America. *Gutta Percha* may be quoted at \$60 to \$100 per picul for prime quality, while *India Rubber* is bringing \$60 to \$70. **Exchange**, four months' bank, is firm at 3/2½.—*Schmidt, Kusterman & Co.*

MANILA, March 5, 1888.—Hemp.—The market is quiet at \$8.25 per picul against \$7.50 same time last year, the price, cost and freight, being \$29.15 against \$27.10/6 last year. Cleared for the United States since the last cable, 20,000 bales; since January 1, 39,000, loading 3000. Cleared for England since January 1, 42,000, loading 17,000. Cleared for all other ports, 11,000. Receipts at all ports since January 1, 103,000, against last year 75,000, and in 1886 of 72,000. Freight \$5; exchange, 3/8½.—*Ker & Co.* per cable direct to *Charles Nordhaus, New York.*

COLOMBO, February 2, 1888.—Plumbago.—Our market has been steady and moderately active, being quoted in rupees per ton: Large Lumps, 145; Ordinary Lumps, 115 @ 145; Chips, 80 @ 90, and Dust, 37.50 @ 60. *Coir Yarn*, No. 1 to 4, may be quoted 7 @ 12 rupees per cwt. and *Ebony* 125 rupees per ton. Plumbago shipments since October 1, in cwt., to England 36,616; to Marseilles, 38; to Hamburg, 2557; to Antwerp, 1524; to India, 82 and to United States 63,412—altogether, 104,229, against 83,072 last year, 64,515 in 1886 and 63,336 in 1885. **Exchange**, six months' sight, 1/5 1/2.—*Volkart Brothers.*

WEST INDIES.

PORT OF SPAIN, TRINIDAD, February 3, 1888.—Asphaltum.—There has been a good demand at well-sustained figures. Boiled selling at \$13.25 and Crude at \$5.50. The total export since January 1st has amounted to 3631 tons, against 1175 tons last year and 1700 in 1886. **Exchange**, 90 days, London, \$4.77 to \$4.83.—*E. P. Masson.*

SPAIN.

BILBAO, February 18, 1888.—Iron Ore.—The week has been a dull one at 7/6 @ 7/8 for Campanil, and 6/3 @ 7/ for Rubios. The flat state of the market arises from the damp weather and the exhaustion of available supply. Exports amounted for the week to 57,768 tons, being since January 1st altogether 504,410 tons, against 521,767 during the same time last year. **Pig Iron.**—There were exported during the week 605 tons coastwise and none abroad.—*Bilbao Marítimo y Comercial.*

GERMANY.

HAMBURG, March 3, 1888.—Iron.—The German Iron markets have been as firm as ever. The inquiry in Rhenish Westphalia has at times been quite lively, statistics both in point of production and consumption are decidedly favorable. The position of Pig Iron is a most encouraging one, thus the output was 122,000 tons in January, against 123,400 in December, while the stock decreased from 37,000 on January 1 to 34,000 on February 1. While this is the case the syndicate has looked the following orders: 131,750 tons Foundry; 21,640 Bessemer; 54,870 Thomas, and 104,030 Forge Pig. This does not include the amounts of Pig turned out by some works for own consumption. At

Siegen the blast furnaces are fully booked all the way to July 1. A better demand has sprung up for Spiegel for the United States at 50 marks per ton, and the tendency is still upward. Since in France temporary admission has been abolished there is a good demand for Pig for that country. Several Continental steel works are in the market for large amounts of Spiegel. Forge Pig is quiet for the moment after sales have been made all the way to October 1, the price being 53 marks. Luxembourg Forge Pig has been improving uninterruptedly, Gray being quoted 40 marks. Foundry Pig has been steady. They quote Bessemer 54, and Thomas 46 marks per ton. No particular change has occurred in Finished, for which the demand, however, keeps ahead of production. Great efforts have been made to raise prices, not only in Rhenish Westphalia, but also in Upper Silesia, but as quite a number of new rolling mills are on the point of going into operation, the production is on the increase, while there is hardly any export demand. In the Sheet Iron branch consumption is outrunning production all along. As for the Wire branch, no particular change can be reported. The general situation of the same continues satisfactory, although sanguine expectations in connection with the syndicate have so far not been quite fulfilled. At the advanced price of 165 marks for Wire Nails they are moving off tolerably well for home use and export. This figure is not yet very remunerative. Foundries and machine shops are, on the whole, doing very well. We quote Merchant all the way up to 130; angles, 132.50; Hoops 140; Bessemer Billets, 135; Boiler Plates, 165; Wire Rods, 115 @ 116. **Metals.**—After the decline in February, this month shows a partial recovery in all Metals, and consumers willingly submit to the enhanced figures.—*Borsenhalle.*

BELGIUM.

BRUSSELS, March 3, 1888.—Iron.—The Belgian Iron markets are still in an anomalous condition, inasmuch as Pig Iron still goes on improving, while Finished does not quite follow suit. Meanwhile the demand continues tolerably brisk for the latter. Structural Iron begins to pick up somewhat likewise, now that the spring season is at hand and makes itself felt gradually. As for the general situation of Finished, it may be stated that there are orders some six weeks ahead, but that the demand is not quite up to what it was last year at this time. Hence there is a lack of buoyancy in Merchant at 12 francs, and it seems that some shading is now and then necessary in order to move off larger amounts. In a week or two we shall be better able to form a judgment as to the spring trade and the volume it is likely to take at present prices. The general impression seems to be that no apprehensions need be felt on that score.—*Moniteur Industriel.*

FRANCE.

PARIS, March 3, 1888.—Metals.—Confidence in the maintenance of current prices seems to have been strengthened somewhat, now that spring is at hand and real wants make themselves felt, and consumers are from all appearances prepared to pay ruling prices, which has steadied the market and enables us to quote as follows, in francs per 100 kg.: **Copper**, Chili Bars, 195 @ 200; Ingots and Slabs, 195; Best Selected, 200, and pure Corocoro Ore, 185; **Tin**, Banca, 445; Billiton, 442.50; Straits, 440, and English, 410. **Lead**, 37 @ 38. **Spelter**, 53 @ 54. **Iron.**—In this market the advance has been well established at 13 50 francs per 100 kg. for beams and 14 for Merchant. At these figures there is a lively demand, the spring season setting in under favorable auspices. It appears that building prospects are good once more, after the disappointment entailed last year and the year before. The more harmonious working between the syndicate of Northern France with makers in other portions of the country, Paris included, inspires dealers and consumers with greater confidence in the stability of iron prices for the spring campaign, and as at the same time public works and the demand for the naval department promise well for both spring and summer, the general impression is a decidedly favorable one among makers in the various districts.—*Moniteur des Intérêts Matériels.*

AUSTRIA.

VIENNA, March 1, 1888.—Iron.—The advance of ½ florin per 100 kg. in Merchant Iron has given a certain impulse to dealings favorable to the development of the spring trade. There is a revival in the demand, and as stocks in the hands of consumers and dealers are known to be light, comparatively speaking, it is likely that the inquiry will remain steady, and even active, for some time to come. In Pig Iron there are, on the other hand, no signs of an improvement, which is probably due to the less firm markets abroad. On the other hand, spot Iron is in active request, and this may also be said of Hardware. In Bohemia Finished Iron and Hollow-ware remain dull,

but there is a better market for agricultural implements and tools. Trade in Hungary has been exceptionally animated. We quote in this market: **Pig Iron**, per ton, 38 @ 46 florins; **Merchant**, 105 @ 125; **Sheets**, 145 @ 175; **Galvanized**, do. 235 @ 315, and **Beams**, 115 @ 118. **Metals.**—The demand has been rather steadier and larger. Following are the closing quotations per 100 kg.: **Copper**, 102; **Lead**, 22.50; **Spelter**, 27.50; **Banca Tin**, 210; **Antimony**, 55, and **Quicksilver**, 300.—*Handels Journal.*

RUSSIA.

ST. PETERSBURG, March 1, 1888.—Petroleum.—The Russian Government has made a concession for the laying of a pipe line to the engineer Imoff, who represents a group of Belgian, French and Russian capitalists, the said line to convey Naphtha from the Caspian to the Black Sea. The Belgian group is formed by the Cockerill Company, the Liege firm of Chaudoir & Co. and Brussels and Liege banking firms. The French group is represented by the firm of Laveissière & Sons, who, together with various Russian companies, engage to finish the line of 800 km. during the term of three years. The cost of the enterprise will exceed 50,000,000 francs; the annual capacity of the line is to be 1,280,000 tons of Naphtha; the concession is granted for 60 consecutive years. The Russian Government binds itself not to grant a concession for a pipe line within 10 years after it will be in operation, but it reserves the privilege of claiming the option of buying the entire line after it shall have been in running order during 20 years. The charge of conveyance of Naphtha through the line has been fixed at 10 copecks per pud as a maximum, hence at no time will the gross earnings of the new company exceed 8,000,000 rubles per annum. It should be added that this line will be in working order during the first six months of the current year from the Michailow to the Kvirly station on the Transcaucasian Railroad.—*Journal de St. Petersburg.*

The Machinists' Supply Company, 216 Lake street, Chicago, had their stock of tools and hardware damaged to some extent as the result of a fire in their building on the 9th inst. The fire was confined to the upper stories, but the lower stories, occupied by the company, were deluged with water. Fortunately the finest tools were not touched, so that the loss may not amount to more than \$2000, which is fully covered by insurance. The business of the company has not been interrupted, and the damage to the building is not great enough to compel their removal to other quarters. The chief sufferers by the fire were the Chicago Stained Glass Company, on an upper floor, as they were completely burned out. Their loss is \$2500, covered by insurance. The fire was caused by a boy stepping on a parlor match, which ignited and then set fire to the floor in the stained glass works, which was saturated with kerosene.

A dispatch from St. Paul, Minn., under date of the 26th ult., says: "A contract has been concluded between the Great Falls Water Power Company, of Montana, and the Montana Smelting Company, by which the last named corporation are to proceed with the erection of smelting furnaces at the Great Falls of the Missouri on a larger scale than has ever before been undertaken, making the largest plant of the kind in the world. The Montana Smelting Company are composed of practically the same gentlemen that are interested in the Colorado Smelting Company, of Pueblo, one of the largest establishments in Colorado. The company have acquired 250 acres of land at Great Falls, and have already purchased 2,500,000 brick, all that can be obtained at Great Falls and Helena, for the erection of their buildings. Contracts for the buildings and plant have already been made, 25,000 tons of metal from the Montana mines contracted for, and the new works will be in active operation by August of the present year. The capital stock of the new company is \$1,500,000, which will be increased as required, and their plans call for the expenditure of nearly \$2,000,000 for the erection of furnaces and structures to accommodate the business that is to be done.

Refrigerator Catch.

The cuts given below represent a new catch for refrigerator and other similar use which is manufactured by Post & Co., Cincinnati, Ohio. Fig. 1 gives a front view of the catch, and Fig. 2 shows the reverse, indicating the manner in which it works. As will readily be understood from the illustrations the catch is operated by a spiral spring on the under side, there being stops which permit the handle to be turned only a suitable distance. An interesting feature of the latch is the manner

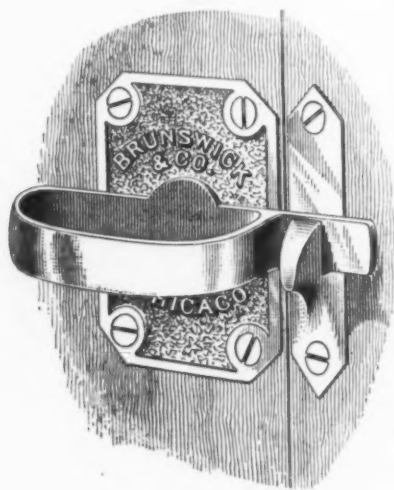


Fig. 1.—Refrigerator Catch.

by which it is made either right or left hand, as desired. The collar which is connected with the spring has a lug which strikes the stops, this collar being fastened to the pivot on which the handle turns by means of a set-screw. By withdrawing this set-screw the handle can be reversed, thus changing the hand of the lock, when the set-screw being again inserted it is ready for use. It will thus be seen that this catch is exceedingly simple in construction and easily adjusted. A sample we have seen is attractively finished and nickel plated. It bears the name Brunswick & Co., for whom it is made by the manufacturers. The goods when made regularly

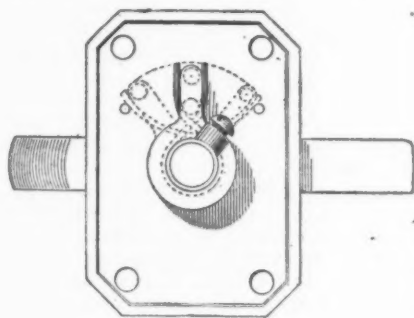


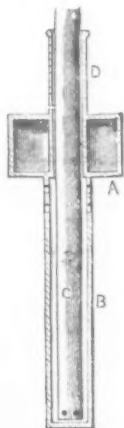
Fig. 2.—Reverse of Catch.

for the trade omit the name, the whole of the face of the plate being finished as indicated in the cut.

Cistern Pump Attachment.

J. T. Wagner, No. 252 Broadway, New York, has recently become the sales agent for what is known as Allen's cistern improvement, the invention of George A. Allen, of Madison, N. J. It is a device for drawing pure water from cisterns, and it is intended to render it possible to take water from near the center of the volume of water that a cistern may contain, rather than to draw constantly from the bottom. It consists of a jacket or tube surrounding

the suction-pipe. The tube is closed at the bottom, and is provided with a float which rises and falls with the water. The water is admitted in the floating tube or

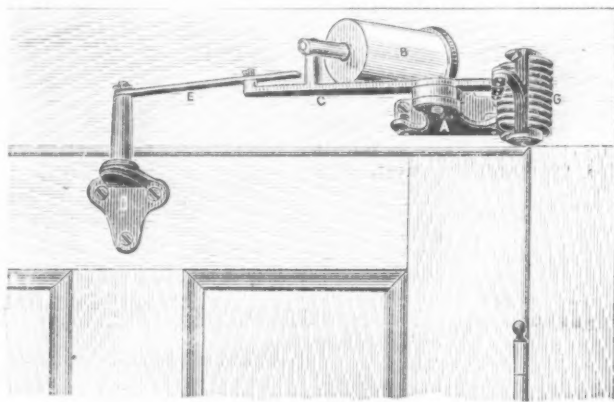


Cistern Pump Attachment.

jacket by perforations under the float. The suction-pipe can only draw the water that enters the tube, thereby obtaining pure and clear water free from surface scum or bottom sediment. The float is adjusted to keep the tube at about the middle of the body of water. Referring to the accompanying engraving, which is sectional, B D represents the tube, A the float and C the pipe leading to the pump.

The "Home" Combined Door Check and Spring.

The Russell & Erwin Mfg. Company, New Britain, Conn., with warehouses Nos. 43 to 47 Chambers street, New York, and 19 North Fifth street, Philadelphia, are putting upon the market a series of door



The "Home" Combined Door Check and Spring.

checks and springs combined; also door check without springs, bearing the general term of "Home Door Checks." One of these is illustrated in the accompanying cut. It represents the form of check and spring combined, adapted to attaching to a casing and door on the side where the door comes flush, or nearly flush, with the casing. By a modification of one or two minor parts the check is adapted for working upon the opposite side of the door. The check and spring in themselves are adapted for use on either right or left doors. By reference to the engraving it will be seen that the spring is spiral variety and is so arranged as to be in very compact form. An air cylinder serves as a cushion for receiving the thrust of the door in swinging, and by means of adjustments in the connecting lever between the pivot screwed to the door and the pivot to which the air piston is directly connected more or less of the force exerted by the spring is secured. In other words, an adjustment

is provided adapting the spring for use on doors of different sizes. The construction of the device is such as to be self-contained and easily put in place. If the door be swung beyond the center it is forced wide open and will stay in that position. In closing, the motion of the door through the larger portion of the arc is rapid until the air piston has an opportunity to exert its influence. It is then stopped without noise and allowed to close gently, and yet with sufficient force to throw the latch. The action of the spring is such that when the door is entirely shut it is exerted in the direction of holding it shut. This device is made in different sizes and adapted for use in different places. It is furnished in various styles of finish, adapting it for use in almost every conceivable place. A change from right to left is made within the article itself by simply shifting the bracket carrying the spring.

A New Pocket Tool Holder.

C. E. Jennings & Co., Nos. 79 and 81 Reade street, New York, are just putting



Fig. 1.—New Pocket Tool Holder.—The Handle.

upon the market a pocket tool holder that is undoubtedly of interest to a large class among our readers. The device in its general appearance when closed, in some respects, resembles an ordinary pocket knife; it exceeds in size what would be called a pen knife and may be compared to the useful "Barlows" which were very

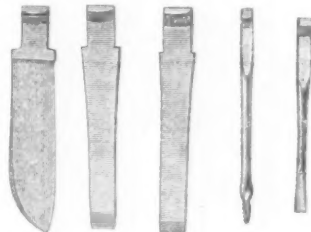


Fig. 2.—Tools Included in the New Pocket Tool Holder.

changed, one for the other. One of the cuts presented herewith, Fig. 1, shows the handle with the lid swung round, as would be necessary for removing the tools

from their resting place. The engraving, Fig. 2, shows the tools in detail. These, it will be seen, consist of a gimlet bit, a screw driver, an awl, a chisel and a knife blade. Each of these tools is nicked in the shank and is adapted to be fitted into a socket in the end of the handle. The cover as it swings around locks the tool in place by means of the groove already referred to. The tools are very firmly held and the handle large enough to afford a good grip in use. The handle is made of malleable iron, nickel-plated, while the tools are of a good quality of steel.

Egg Poacher and Frier.

Paine, Diehl & Co., Philadelphia, Pa., are putting on the market the patent Egg Poacher and Frier shown in the accom-

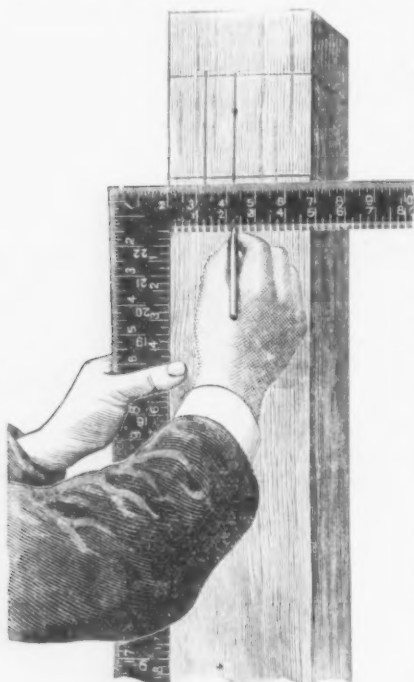


Egg Poacher and Frier.

panying cut, which indicates the form in which it is constructed and the manner in which the handle is applied. The rings are made of cast iron, the handle being, as shown, detachable. As indicated by the name, it will be seen that this article is intended for use in frying as well as in poaching eggs. That it is easily cleaned, and holds the eggs in perfect shape, are points mentioned by the manufacturers.

The Crenelated Square.

A novelty in steel squares is just being introduced by the Peck, Stow & Wilcox Company, No. 27 Chambers street, New



The Crenelated Square.

York. It is illustrated in the engraving. The device has been suggested for rapidly laying off a frame of a building or of any

timber work. The tongue, it will be noticed, is notched to correspond to the $\frac{1}{4}$ -inch spaces. Accordingly, used as shown in the engraving with a pencil or scratch awl in the proper places, the laying off of tenons and other shapes is rapidly accomplished. It is claimed that with the use of this square a workman can do twice the amount of marking in a given length of time. The manufacturers allude also to other advantages possessed by this square.

Plumbing Furnace.

Tillinghast & Hoile, 23 East Sixth street, Brooklyn, N. Y., are directing the attention of the trade to a novel construction in plumbers', tinners' and roofers' furnaces, some idea of which is afforded by the accompanying engravings. The first repre-



sents the general appearance of the furnaces as arranged for tinners' and roofers' use. The second shows an interior section through a tinners' furnace. The third shows the exterior of the furnace when



Fig. 1.—Furnace Adapted for the Use of Tinners and Roofers.

adapted to plumbers' requirements, and the fourth a cross section through the latter, indicating the position of the melting pot, and also showing the construction of the frame for holding the pot in position. In the latter case, it will



Fig. 2.—Vertical Section through Tinners' Furnace.

be noticed that a copper is inserted below the grate. The makers put forth the somewhat remarkable assertion that the heating capacity of this furnace is such that a copper is readily heated in the position shown in the lower part of the cut.

These furnaces are adapted for the use of broken coke or charcoal. It is stated that if coke is used the furnace can be supplied with fuel at a cost of less than 25 cents per week; where charcoal is used it



Fig. 3.—Exterior View of Plumbers' Furnace.

is stated that the saving is 50 per cent., as compared with furnaces of ordinary construction. Where coke is employed it must be broken into pieces not larger than a walnut. The circular issued by the mak-

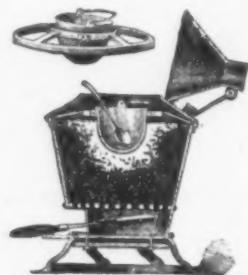


Fig. 4.—Cross Section through Plumbers' Furnace.

ers contains a list of a number of prominent plumbers and metal workers in Brooklyn who are using this device. It is claimed that the saving is sufficient to pay for the furnace in a very short time. A heavy asbestos bottom is provided which serves to prevent the burning of the bench, floor or carpet.

The Hamburg-American Steamship Company, not to be outdone by their rivals, are having built two steamships of 10,000 tons each and 12,500 horse-power—one at Stettin and the other at Birkenhead, to be ready for service a year hence. They will have a length of 460 feet, and will be 56 feet wide and 38 feet deep. Eleven bulkheads will divide the vessels into water-tight compartments, and, as none will have an entrance below the main deck, the vessels will not only be practically unsinkable, but safe from fire. Should two even of the largest compartments be flooded, the vessels will still be safe and navigable. The two engines will be in separate compartments, subdivided by a water-tight bulkhead, and each set of machinery will drive a separate screw. The steamers will have double bottoms, and will be made of as light a draft as possible to enable the vessels to run up the Elbe as far as Hamburg and to cross Sandy Hook Bar at all tides. The boilers will be in three water-tight compartments, cut off from each other.

The proposed new treaty with China absolutely prohibits the landing of emigrants from that country in the United States, and provides for the payment of between \$200,000 and \$300,000 indemnity to China on account of injuries done to subjects of that Government during riots on the Pacific coast.

CURRENT HARDWARE PRICES.

MARCH 7, 1888.

Note.—The quotations given below represent the Current Hardware Prices which prevail in the market at large. They are not given as manufacture prices, and manufacturers should not be held responsible for them. In cases where goods are quoted at lower figures than the manufacturers name, it is stated that the manufacturers are selling at the prices quoted, but simply that the goods are being sold, perhaps, by the manufacturers, perhaps by the jobber at the figures named.

Ammunition.

Caps, Percussion, 1000—	
Dicks & Goldmark's	
F. L. Waterproof, 1-10's.....	50¢
E. B. Trimmer Edge, 1-10's.....	55¢
E. B. Ground Edge, Central Fire, 1-10's.....	70¢
Double Waterproof, 1-10's.....	1.40
Musket Waterproof, 1-10's.....	2.25
G. D.....	3.25
S. B.....	3.00
Union Metallic Cartridge Co.	
F. L. Trimmer.....	50¢
F. L. Ground.....	55¢
Cent. Fire Ground.....	70¢
Double Waterproof.....	1.40
Double Waterproof, in 1-10's.....	1.40
S. B. Genuine Imported.....	4.50
Eley's E. B.....	54¢
Eley's D Waterproof, Central Fire.....	1.00

Cartridges—

Rim Fire Cartridges.....	dis 50¢ & 2¢
Rim Fire Military Cartridges.....	dis 15¢ & 2¢
Cent. Fire Cartridges, Pistol and Rifle.....	dis 25¢ & 2¢
Cent. Fire Cartr., Military & Sporting.....	dis 15¢ & 2¢
Blank Cartridges, except 25 and 32 cal., an additional 10% over above discounts.....	
Blank Cartridges, 22 cal.....	dis 17.5¢
Blank Cartridges, 32 cal.....	dis 35.0¢
Primed Shells and Bullets.....	dis 15¢ & 2¢
B. B. Caps, Round Ball.....	dis 17.5¢
B. B. Caps, Conical Ball, Swaged.....	dis 20.0¢

Primers—

Berdan Primers all sizes, and B. L. Caps (for Sturtevant Shells).....	dis 1.00, dis 2¢
All other Primers, all sizes.....	dis 1.20, dis 2¢

Shells—

First quality, 4, 8, 10 and 12 gauge.....	dis 25¢ & 10¢ & 2¢
First quality, 14, 16 and 20 gauge (110 list).....	dis 20¢ & 10¢ & 2¢
Star, Club, Rival and 10-gauge, 90 list (dis 33¢ & 10¢)	
Club, Rival and Climax Brands, 14, 16 and 20 gauge.....	dis 30¢ & 10¢ & 2¢
Self-bolt's Combination Shot Shells.....	dis 15¢ & 2¢
Brass Shot Shells, 1st quality.....	dis 60¢ & 2¢
Brass Shot Shells, Club, Rival & Climax.....	dis 65¢ & 2¢

Shells Loaded—

List No. 19, 1887.....	dis 20¢ & 10¢
Wads—	
U. M. C. & W. R. A.—B. E., 11 up.....	\$2.00
U. M. C. & W. R. A.—B. E., 9 & 10.....	2.30
U. M. C. & W. R. A.—B. E., 7 & 8.....	2.60
U. M. C. & W. R. A.—P. E., 11 up.....	8.10
U. M. C. & W. R. A.—P. E., 9 & 10.....	4.00
U. M. C. & W. R. A.—P. E., 7 & 8.....	4.00
Eley's B. E., 11 up.....	\$1.75
Eley's P. E., 11 up.....	\$2.80

Anvils—

Wright's—Eagle Anvil.....	\$ 104, dis 20¢ & 20¢
Armstrong's Mouse Hole.....	dis 11¢
Armstrong's Mouse Hole, Extra.....	dis 11¢
Frenton.....	dis 11¢
Wilkinson's.....	dis 11¢
J. & Riley Carr. Patent Solid.....	dis 11¢
Good Vis. Drill.....	dis 11¢
Miller's Falls Co.....	dis 11¢
Cheney Anvil and Vise.....	dis 25¢
Allen Combined Anvil and Vise.....	dis 40¢ & 10¢
Moore & Barnes Mfg. Co.....	dis 33¢

Augers and Bits.

Douglas Mfg. Co.....	
New Haven Copper Co.....	
Wm. A. Ives & Co.....	dis 70¢ & 70¢ & 5¢
Rumpleyville Mfg. Co.....	
French, Swift & Co. (F. H. Beecher)	
Connecticut Valley Mfg. Co.....	
Cook's, Douglas Mfg. Co.....	dis 55¢
Cook's, New Haven Copper Co.....	dis 50¢ & 10¢ & 50¢ & 10¢ & 5¢
Ives' Circular Lip.....	dis 60¢
Patent Solid Head.....	dis 30¢
C. E. Jennings & Co., No. 10, extension lip.....	dis 40¢
C. E. Jennings & Co., No. 30.....	dis 60¢
C. E. Jennings & Co., Auger Bits, in fancy boxes.....	
Set, 32¢ quarters, No. 5, 10, No. 30, 2.....	dis 20¢
Lewis' Patent Single Twist.....	dis 45¢
Russell Jennings' Augers and Bits.....	dis 25¢
"Imitation Jennings' Bits (new list).....	dis 60¢ & 25¢
Fugh's Black.....	dis 15¢ & 10¢ & 60¢
Car Bits.....	dis 15¢ & 10¢
L'Hommedieu Car Bits.....	dis 15¢ & 10¢
Forstner Pat. Auger Bits.....	dis 10¢

Hollow Augers—

Ives.....	dis 25¢ & 10¢
French, Swift & Co.....	dis 25¢ & 10¢
Douglas.....	dis 25¢ & 10¢
Bonney's Adjustable.....	dis 40¢ & 10¢
Stearns.....	dis 20¢
Ives' Expansive, each \$1.50.....	dis 50¢ & 10¢
Universal Expansive, each \$1.50.....	dis 20¢
Wood's.....	dis 25¢ & 25¢ & 10¢

Expansive Bits—

Clark's small, 18; large, 30.....	dis 35¢ & 55¢ & 5¢
Ives' No. 4, per doz., 800.....	dis 35¢ & 40¢
Swan's.....	dis 40¢
Stearns, No. 1, 32; No. 2, 32.....	dis 35¢
Stearns' No. 2, 48.....	dis 20¢

Gimlet Bits—

Common.....	dis 25¢ & 25¢ & 33.25
Diamond.....	dis 1.10, dis 25¢ & 10¢
"Bee".....	dis 25¢ & 25¢ & 5¢
Double Cut, Shepardson's.....	dis 45¢ & 45¢ & 5¢
Double Cut, Ct. Valley Mfg. Co.....	dis 30¢ & 10¢
Double Cut, Hartwell's, w. gro.....	dis 35.25
Double Cut, Douglas's.....	dis 40¢ & 10¢
Double Cut, Ives'.....	dis 60¢ & 60¢ & 5¢

Bit Stock Drills—

Standard.....	dis 50¢ & 10¢ & 5¢
Morse.....	dis 50¢ & 10¢ & 5¢
Cleveland.....	dis 50¢ & 10¢ & 5¢
Syracuse, for metal.....	dis 50¢ & 10¢ & 5¢
Syracuse, for wood (wood list).....	dis 30¢ & 30¢ & 5¢
Williams' or Holt's, for metal.....	dis 50¢ & 10¢ & 5¢
Williams' or Holt's, for wood.....	dis 40¢ & 10¢

Ship Augers and Bits—

L'Hommedieu's.....	dis 15¢ & 10¢
Watrous's.....	dis 15¢ & 10¢
Snell's.....	dis 15¢ & 10¢
Snell's Ship Auger Pattern Car Bits.....	dis 15¢ & 10¢

Awl Hints.

Sewing, Brass Ferrule.....	\$3.50 w gross—dis 45¢ & 10¢
Patent Sewing, Short.....	\$1.00 w gross—dis 40¢ & 10¢
Patent Sewing, Long.....	\$1.20 w gross—dis 40¢ & 10¢
Patent Peg, Plain Top.....	\$10.00 w gross—dis 45¢ & 10¢
Patent Peg, Leather Top.....	\$12.00 w gross—dis 45¢ & 10¢

Awls, Brad Sets, &c.

Awls, Sewing, Common.....	w gross \$1.70—dis 35¢
Awls, Shouldered Peg.....	w gross \$2.45—dis 40¢ & 10¢
Awls, Patent Peg.....	w gross \$3.60—dis 40¢ & 10¢
Awls, Shouldered Brad.....	\$2.70 w gross—dis 35¢
Awls, Handled Brad.....	\$7.50 w gross—dis 45¢
Awls, Handled Scratch.....	\$7.50 w gross—dis 35¢ & 10¢
Awls, Socket Scratch.....	\$1.50 w gross—dis 25¢ & 30¢

Awl and Tool Sets.

Allen's Sets, Awls & Tools, No. 20.....	w gross \$10—dis 50¢ & 10¢
Fray's Ad Tool Hds., Nos. 1, 12; 2, 12; 3, 12; 4, 12.....	dis 25¢ & 10¢
Miller's Falls Ad Tool Hds., Nos. 1, 12; 2, 12; 3, 12; 4, 12.....	dis 25¢ & 10¢
Henry's Combination Haft.....	w gross \$2.15—dis 25¢
Brad Sets, No. 42, 10.50, No. 43, 12.50, dis 70¢ & 10¢ & 5¢	
Brad Sets, Stanley's Excelsior, No. 1, \$7.50.....	dis 30¢ & 10¢
Brad Sets, Stanley's Excelsior, No. 2, \$4.00.....	dis 30¢ & 10¢
Brad Sets, Stanley's Excelsior, No. 3, \$5.50.....	dis 30¢ & 10¢

Axes.

Makers' and Special Brands—	
First quality.....	w gross \$6.25 @ \$6.50
Others.....	w gross \$5.75

Axle Grease.

Fraser's, in bulk.....	Eg w \$ 4¢; Pail, w \$ 5¢ net
Fraser's, in boxes.....	w gross \$9.50
Dixon's Everlasting, in bxs., w gross, 1 lb. \$1.20; 2 lb. \$2.20.....	
Dixon's Everlasting.....	10 lb pails, each, 85¢
Lower grades, special brands.....	w gross \$5.50 @ \$7

Axles—

No. 1, 4¢ @ 4½¢ No. 2, 5½¢ @ 5½¢	
No. 7 to 18.....	dis 40¢ & 10¢ @ 50¢
No. 19 to 28.....	dis 60¢ & 10¢ @ 60¢ & 10¢
National Wrought Steel Tubular Self-Oiling.....	
Standard Form (1 to 5) and Special Form (A1 to A5).....	
Less than 10 sets.....	dis 33¢
Over 10 sets.....	dis 33¢ & 25¢
X Strong Exp. (6 to 9), & XX Strong Truck (10 to 16).....	
Less than 10 sets.....	dis 10¢
Over 10 sets.....	dis 10¢ & 5¢

Bag Holders.

Borenklee's Pat., w gross \$15.....	dis 60¢
Balances.—Spring Balances.....	dis 50¢
Common 2 lb.....	w gross, \$1.50—dis 50¢
Chatillon's Spring Balances.....	dis 50¢
Chatillon's Circular Spring Balances.....	dis 60¢

Bells.

Light Brass.....	dis 70¢ & 10¢
Extra Heavy.....	dis 85¢ & 10¢
White Metal.....	dis 60¢ & 10¢ & 10¢
Silver Chime.....	dis 25¢ & 10¢ & 5¢
Globe (Cone's Patent).....	dis 25¢ & 10¢ @ 35¢
Gong, Abbe's.....	dis 25¢ & 10¢ @ 35¢
Gong, Taylor's.....	dis 40¢ & 10¢
Gong, Barton's.....	dis 40¢ & 10¢ @ 50¢
Crank, Taylor's.....	dis 25¢ & 10¢
Crank, Brooks.....	dis 50¢ & 10¢ & 2¢
Crank, Cone's.....	dis 10¢
Crank, Connel's.....	dis 20¢ & 10¢
Lever, Sargent's.....	dis 60¢ & 10¢
Lever, Taylor's Grosse or Plated.....	dis 40¢ & 10¢
Lever, Taylor's Japanned.....	dis 25¢ & 10¢
Lever, R. E. & Co's.....	dis 50¢ & 10¢ & 2¢
Pull, Brook's.....	dis 50¢ & 10¢ & 2¢
Pull Western.....	dis 25¢ & 10¢

Cone.

Common Wrought.....	dis 60¢ & 10¢
Western.....	dis 20¢ & 10¢
Western, Sargent's list.....	dis 70¢ & 10¢
Kentucky "Star".....	dis 20¢ & 10¢
Kentucky, Sargent's list.....	dis 70¢ & 10¢
Dodge, Genuine Kentucky, new list.....	dis 70¢ & 10¢
Texas Star.....	dis 60¢ & 10¢ @ 60¢ & 10¢ & 5¢
Farm Bells.....	dis 25¢
Steel Alloy, Church and Scholt Bells.....	dis 40¢

Bellows.—Blacksmiths.

Holders.....	dis 60¢ & 10¢ & 5¢ @ 60¢
Hand Bellows.....	dis 40¢ & 10¢ @ 10¢

Belting, Rubber.

Common Standard.....	dis 75¢
Standard.....	dis 70¢ & 5¢
Extra.....	dis 60¢ & 10¢
N. Y. B. & P. Co. Standard.....	dis 60¢ & 5¢ & 5¢
N. Y. B. & P. Co. Extra Standard.....	dis 50¢ & 10¢ & 5¢

Bench Stops.

Morrill's.....	w gross \$0—dis 50¢
Hoschkins's.....	w gross \$5.00—dis 10¢ & 10¢ & 10¢
Weston's, per doz No. 1, \$10; No. 2, \$9.....	dis 25¢ & 10¢ & 5¢
McGill's.....	w gross \$3—dis 10¢

Bits.—Auger, Gimlet Bit Stock, Drills, &c., see Augers and Bits.

Bit Holders.

Extension, Barber's.....	w gross \$15.00—dis 40¢ & 10¢
Extension, Ives'.....	w gross \$20.00—dis 60¢ & 10¢
Diagonal.....	w gross \$24.00—dis 40¢
Angular.....	w gross \$24.00—dis 40¢ & 5¢

Blind Adjusters.

Domestic.....	w gross \$3.00—dis 33¢
Excelsior.....	w gross \$10.00—dis 60¢ & 10¢ & 2¢
Washburn's Self-Locking.....	dis 20¢ @ 20¢ & 10¢

Blind Fasteners.

MacKrell's.....	w gross pairs, \$1.00—dis 20¢ & 20¢ & 10¢
Van Sand's Screw Pattern.....	\$15 w gross—dis 60¢ & 10¢
Van Sand's Old Pattern.....	\$15 w gross—dis 55¢ & 10¢
Washburn's Old Pattern.....	\$9 w gross, net
Herriman's.....	new list, net
Austin & Eddy No. 2008.....	\$2 w gross, net
Security Gravity.....	\$2 w gross, net

Blind Staples.

Barbed, ½ in. and larger.....	w gross \$8 @ 8½¢ net
Barbed, ¾ in.....	w gross \$9 @ 9½¢ net

Blocks.

Ordinary Tackle, list April 17, '85.....	dis 40¢
Cleveland Block Co., Mal. Iron.....	dis 50¢

Boils.

Cast Iron Barrel, Square, &c.....	dis 70¢ & 10¢
Cast Iron Shutter Bolts.....	dis 70¢ & 10¢
Cast Iron Chain (Sargent's list).....	dis 60¢ & 10¢
Ives' Patent Door Bolts.....	dis 55¢
Wrought Barrel.....	dis 70¢ & 10¢
Wrought Square.....	dis 70¢ & 10¢
Wt Shutter, all Iron, Stanley's list.....	dis 60¢ & 10¢
Wt Shutter, Brass Knob, Stanley's.....	dis 40¢ & 10¢
Wrought Shutter, Sargent's list.....	dis 60¢ & 10¢
Wrought Sunk Flush, Sargent's list.....	dis 55¢ & 10¢
Wrought Sunk Flush, Stanley's list.....	dis 40¢ & 10¢ & 5¢
Wrought B. K. Flush, Com'n Stanley's list.....	dis 55¢ & 10¢

Carriage—

Com. list June 10, '84.....	dis 70¢ & 10¢ & 5¢
Genuine Eagle, list Oct. '84.....	dis 75¢ & 75¢ & 5¢
Phila. pattern, list Oct. 7, '84.....	dis 75¢ & 10¢ & 75¢ & 10¢ & 5¢
R. E. & W. old list.....	dis 70¢

Tire—

Common, list Feb. 28, 1883.....	dis 65¢ & 10¢
P. C. B. & N. Co., Empire, list Feb. 28, 1883.....	dis 65¢ & 10¢
P. C. B. & N. Co., Philadel., list Oct. 84.....	dis 82¢ & 5¢
P. C. B. & N. Co., Keystone, Phil., list Oct. '84.....	dis 80¢
P. C. B. & N. Co., Norway, Phil., list Oct. '84.....	dis 75¢ & 10¢
Am. S. Co., Norway, Phil., list Oct. 16, '84.....	dis 75¢ & 10¢
Am. S. Co., Eagle, Phil., list Oct. 16, '84.....	dis 80¢
Am. S. Co., Philadel., list Oct. 16, '84.....	dis 82¢ & 5¢
Sm. S. Co., Bay State, list Feb. 28, '83.....	dis 65¢ & 10¢
R. E. & W. Philadel., list Oct. 16, 1884.....	dis 82¢
R. E. Mfg. Co.....	dis 65¢

Stove and Plow.

Stove.....	dis 62¢ & 5¢
Plow.....	dis 60¢ & 5¢
Am. S. Co. Stove, Annealed.....	dis 62¢ & 5¢
R. E. & W. Stove.....	dis 55¢
R. E. Mfg. Co., Stove.....	dis 62¢ & 5¢
Machine.....	dis 75¢ & 75¢ & 5¢
Bolt Ends.....	dis 75¢ & 75¢ & 5¢

Borax.

Boring Machines.	
Without Augers. Upright. Angular.	
Douglas.....	\$5.50 \$6.75 dis 50¢
Snell's, Rice's Patent.....	5.50 6.75 dis 40¢ & 10¢ & 10¢
Jennings.....	5.50 6.75 dis 45¢ & 45¢ & 10¢
Other Machines.....	2.35 2.75
Phillips' Pat., with Augers 7.00.....	7.50 net

World's Best, No. 1, \$12.00; No. 2, \$24.00.
No. 3, \$36.00. \$ gross, No. 1, \$12.00; No. 2, \$24.00.
Universal, No. 1, \$12.00; No. 2, \$24.00.
Domestic, No. 1, \$12.00; No. 2, \$24.00.
Champion, No. 1, \$12.00; No. 2, \$24.00.

Cards.
Horse and Curry, No. 1, \$10.00; No. 2, \$10.00.
Cotton, No. 1, \$10.00; No. 2, \$10.00.
Wool, No. 1, \$10.00; No. 2, \$10.00.

Carpet Stretchers.
Cast Steel, Polished, No. 1, \$10.00; No. 2, \$10.00.
Cast Iron, Steel Points, No. 1, \$10.00; No. 2, \$10.00.
Socket, No. 1, \$10.00; No. 2, \$10.00.
Billard's, No. 1, \$10.00; No. 2, \$10.00.

Carpet Sweepers.
Bissell No. 5, No. 1, \$17.00; No. 2, \$17.00.
Bissell No. 7 New Drop Pan, No. 1, \$17.00; No. 2, \$17.00.
Bissell Grand Rapids, No. 1, \$17.00; No. 2, \$17.00.
Crown Jewel, No. 1, \$17.00; No. 2, \$17.00.
Magic, No. 1, \$17.00; No. 2, \$17.00.
Jewel, No. 1, \$17.00; No. 2, \$17.00.
Mystic, No. 1, \$17.00; No. 2, \$17.00.
Cottage, No. 1, \$17.00; No. 2, \$17.00.
Garland, No. 1, \$17.00; No. 2, \$17.00.
Parlor Queen, No. 1, \$17.00; No. 2, \$17.00.
Housewife's Delight, No. 1, \$17.00; No. 2, \$17.00.
Queen, No. 1, \$17.00; No. 2, \$17.00.
Queen, with band, No. 1, \$17.00; No. 2, \$17.00.
King, No. 1, \$17.00; No. 2, \$17.00.
Weed Improved, No. 1, \$17.00; No. 2, \$17.00.
Hub, No. 1, \$17.00; No. 2, \$17.00.
Cog Wheel, No. 1, \$17.00; No. 2, \$17.00.

Cartridges—See Ammunition.
Casters.
Bed, No. 1, \$10.00; No. 2, \$10.00.
Plate, No. 1, \$10.00; No. 2, \$10.00.
Shallow Socket, No. 1, \$10.00; No. 2, \$10.00.
Deep Socket, No. 1, \$10.00; No. 2, \$10.00.
Yale Casters, list May, 1884, No. 1, \$10.00; No. 2, \$10.00.
Yale, Gem, No. 1, \$10.00; No. 2, \$10.00.
Martin's Patent (Phoenix), No. 1, \$10.00; No. 2, \$10.00.
Payson's Anti-Friction, No. 1, \$10.00; No. 2, \$10.00.
"Giant" Truck Casters, No. 1, \$10.00; No. 2, \$10.00.
Stationary Truck Casters, No. 1, \$10.00; No. 2, \$10.00.

Cattle Leaders.
Humason, Beckley & Co.'s, No. 1, \$10.00; No. 2, \$10.00.
Bargent's, No. 1, \$10.00; No. 2, \$10.00.
Hotchkiss, No. 1, \$10.00; No. 2, \$10.00.
Peck Stow & W. Co., No. 1, \$10.00; No. 2, \$10.00.

Chain.
Trace, 5-10-2, exact sizes, No. 1, \$10.00; No. 2, \$10.00.
Trace, 5-10-2, exact sizes, No. 1, \$10.00; No. 2, \$10.00.
Trace, 7-10-2, exact sizes, No. 1, \$10.00; No. 2, \$10.00.

NOTE.—Traces, "Regular" sizes 3¢ net per pair less than exact.
Log, Fifth, Stretcher, and other fancy Chains, list Nov. 1, 1884, No. 1, \$10.00; No. 2, \$10.00.
American Coll 3-16, No. 1, \$10.00; No. 2, \$10.00.
In cast lots, 8.50, 6.25, 5.25, 4.00, 4.20, 3.05, 3.75.
Less than cast lots, add 4¢ per lb.
German Coll, list of June 20, 1887, No. 1, \$10.00; No. 2, \$10.00.
Ger. Halter Chain, list of June 20, 1887, No. 1, \$10.00; No. 2, \$10.00.
Covert Halter, Hitching and Breast, No. 1, \$10.00; No. 2, \$10.00.
Covert Traces, No. 1, \$10.00; No. 2, \$10.00.
Oneida Halter Chain (old list), No. 1, \$10.00; No. 2, \$10.00.
Galvanized Pump Chain, No. 1, \$10.00; No. 2, \$10.00.
Jack Chain, Iron, No. 1, \$10.00; No. 2, \$10.00.
Jack Chain, Brass, No. 1, \$10.00; No. 2, \$10.00.

Chalk.
White, No. 1, \$10.00; No. 2, \$10.00.
Red, No. 1, \$10.00; No. 2, \$10.00.
Blue, No. 1, \$10.00; No. 2, \$10.00.
White Crayons, No. 1, \$10.00; No. 2, \$10.00.

Chalk Lines—See Lines.
Chisels.
Socket Framing and Firmer—
Wetherby and Douglas, No. 1, \$10.00; No. 2, \$10.00.
P. S. & W., No. 1, \$10.00; No. 2, \$10.00.
New Haven and Middlesex, No. 1, \$10.00; No. 2, \$10.00.

Clamps.
Providence Tool Co.'s Wrought Iron, No. 1, \$10.00; No. 2, \$10.00.
Adjustable, Gray's, No. 1, \$10.00; No. 2, \$10.00.
Adjustable, Lambert's, No. 1, \$10.00; No. 2, \$10.00.
Adjustable, Snow's, No. 1, \$10.00; No. 2, \$10.00.
Adjustable, Hammer's, No. 1, \$10.00; No. 2, \$10.00.
Adjustable, Stearns', No. 1, \$10.00; No. 2, \$10.00.
Stearns' Adjustable Cabinet and Corner, No. 1, \$10.00; No. 2, \$10.00.
Cabinet, Sargent's, No. 1, \$10.00; No. 2, \$10.00.
Carriage Makers', Sargent's, No. 1, \$10.00; No. 2, \$10.00.
Eberhard Mfg. Co., No. 1, \$10.00; No. 2, \$10.00.
Warner's, No. 1, \$10.00; No. 2, \$10.00.
Saw Clamps, No. 1, \$10.00; No. 2, \$10.00.

Clips.
Norway, Axle, 1/4 & 5-16, No. 1, \$10.00; No. 2, \$10.00.
Second grade Norway Axle, 1/4 & 5-16, No. 1, \$10.00; No. 2, \$10.00.
Superior Axle Clips, No. 1, \$10.00; No. 2, \$10.00.
Norway Spring Bar Clips, 5-16, No. 1, \$10.00; No. 2, \$10.00.
Wrought-Iron Felloe Clips, No. 1, \$10.00; No. 2, \$10.00.
Steel Felloe Clips, No. 1, \$10.00; No. 2, \$10.00.

Cocks.
Hardware list, No. 1, \$10.00; No. 2, \$10.00.

Coffee Mills.
Box and Side, list revised Jan. 1, 1888, No. 1, \$10.00; No. 2, \$10.00.
Seiber's Patent, No. 1, \$10.00; No. 2, \$10.00.
American, Enterprise Mfg. Co., No. 1, \$10.00; No. 2, \$10.00.
The "Swift," Lane Bros., No. 1, \$10.00; No. 2, \$10.00.
Webb's Patent, No. 1, \$10.00; No. 2, \$10.00.

Compasses, Dividers, &c.
Compases, Calipers, Dividers, &c., No. 1, \$10.00; No. 2, \$10.00.
Bemis & Call Co.'s Dividers, No. 1, \$10.00; No. 2, \$10.00.
Bemis & Call Co.'s Compases & Calipers, No. 1, \$10.00; No. 2, \$10.00.
Bemis & Call Co.'s Wing & Inside or Outside, No. 1, \$10.00; No. 2, \$10.00.
Bemis & Call Co.'s Double, No. 1, \$10.00; No. 2, \$10.00.
Bemis & Call Co.'s (Call's Patent Inside), No. 1, \$10.00; No. 2, \$10.00.
Excelior, No. 1, \$10.00; No. 2, \$10.00.
J. Stevens & Co.'s Calipers and Dividers, No. 1, \$10.00; No. 2, \$10.00.

Coopers' Tools.
Bradley's, No. 1, \$10.00; No. 2, \$10.00.
Barton's, No. 1, \$10.00; No. 2, \$10.00.
L. & J. White, No. 1, \$10.00; No. 2, \$10.00.
Albertson Mfg. Co., No. 1, \$10.00; No. 2, \$10.00.
Beatty's, No. 1, \$10.00; No. 2, \$10.00.
Sandusky Tool Co., No. 1, \$10.00; No. 2, \$10.00.

Corkscrews.
Humason & Beckley Mfg. Co., No. 1, \$10.00; No. 2, \$10.00.
Clough's Patent, No. 1, \$10.00; No. 2, \$10.00.
Howe Bros. & Hulbert, No. 1, \$10.00; No. 2, \$10.00.

Corn Knives and Cutters.

Bradley's, No. 1, \$10.00; No. 2, \$10.00.
Wadsworth's, No. 1, \$10.00; No. 2, \$10.00.

Cradles—Grain.
Cradles, No. 1, \$10.00; No. 2, \$10.00.

Crow Bars.
Cast Steel, No. 1, \$10.00; No. 2, \$10.00.
Iron, Steel Points, No. 1, \$10.00; No. 2, \$10.00.

Curry Combs.
Fitch's, No. 1, \$10.00; No. 2, \$10.00.
Rubber, No. 1, \$10.00; No. 2, \$10.00.
Perfect, No. 1, \$10.00; No. 2, \$10.00.

Curtain Pins.
Silvered Glass, No. 1, \$10.00; No. 2, \$10.00.
White Enamel, No. 1, \$10.00; No. 2, \$10.00.

Cutlery.
Reaver Falls and Booth's, No. 1, \$10.00; No. 2, \$10.00.
Wostenholme's, No. 1, \$10.00; No. 2, \$10.00.

Dampers, &c.
Dampers and Clips, Buffalo, No. 1, \$10.00; No. 2, \$10.00.
Crown Damper, No. 1, \$10.00; No. 2, \$10.00.
Excelior, No. 1, \$10.00; No. 2, \$10.00.

Dividers—See Compasses.
Dog Collars.
Embossed Gilt, Pope & Stevens' list, No. 1, \$10.00; No. 2, \$10.00.
Leather, Pope & Stevens' list, No. 1, \$10.00; No. 2, \$10.00.
Brass, Pope & Stevens' list, No. 1, \$10.00; No. 2, \$10.00.

Door Springs.
Torrey's Rod, regular size, No. 1, \$10.00; No. 2, \$10.00.
Gray's, No. 1, \$10.00; No. 2, \$10.00.
Bee Rod, No. 1, \$10.00; No. 2, \$10.00.
Warner's No. 1, \$10.00; No. 2, \$10.00.
Gem (Coll), list April 19, 1884, No. 1, \$10.00; No. 2, \$10.00.
Star (Coll), list April 19, 1884, No. 1, \$10.00; No. 2, \$10.00.
Victor (Coll), No. 1, \$10.00; No. 2, \$10.00.
Champion (Coll), No. 1, \$10.00; No. 2, \$10.00.
Philadelphia, No. 1, \$10.00; No. 2, \$10.00.
Cowell's, No. 1, \$10.00; No. 2, \$10.00.
Rubber, complete, No. 1, \$10.00; No. 2, \$10.00.
Hercules, No. 1, \$10.00; No. 2, \$10.00.
Shaw Door Check and Spring, No. 1, \$10.00; No. 2, \$10.00.
Elliott's Door Check and Spring, No. 1, \$10.00; No. 2, \$10.00.

Drawing Knives.
Wetherby and Douglas, No. 1, \$10.00; No. 2, \$10.00.
P. S. & W., No. 1, \$10.00; No. 2, \$10.00.
New Haven and Middlesex, No. 1, \$10.00; No. 2, \$10.00.

Drills and Drill Stocks.
Blacksmith's, No. 1, \$10.00; No. 2, \$10.00.
Blacksmith's Self-Feeding, No. 1, \$10.00; No. 2, \$10.00.
Breast, P. S. & W., No. 1, \$10.00; No. 2, \$10.00.
Breast, Wilson's, No. 1, \$10.00; No. 2, \$10.00.
Breast, Millers Falls, No. 1, \$10.00; No. 2, \$10.00.
Breast, Bartholomew's, No. 1, \$10.00; No. 2, \$10.00.
Ratchet, Merrill's, No. 1, \$10.00; No. 2, \$10.00.
Ratchet, Ingalls', No. 1, \$10.00; No. 2, \$10.00.
Ratchet, Parker's, No. 1, \$10.00; No. 2, \$10.00.
Ratchet, Whitney's, No. 1, \$10.00; No. 2, \$10.00.
Ratchet, Weston's, No. 1, \$10.00; No. 2, \$10.00.
Ratchet, Moore's Triple Action, No. 1, \$10.00; No. 2, \$10.00.
Whitney's Hand Drill, Plain, \$11.00, Adjustable, No. 1, \$10.00; No. 2, \$10.00.
Wilson's Drill Stocks, No. 1, \$10.00; No. 2, \$10.00.
Automatic Boring Tools, No. 1, \$10.00; No. 2, \$10.00.

Drill Bits—See Augers and Bits.
Drill Chucks—See Chucks.
Dripping Pans.
Small sizes, No. 1, \$10.00; No. 2, \$10.00.
Large sizes, No. 1, \$10.00; No. 2, \$10.00.

Egg Beaters.
Blower, No. 1, \$10.00; No. 2, \$10.00.
National, No. 1, \$10.00; No. 2, \$10.00.
Family (T. & S. Mfg. Co.), No. 1, \$10.00; No. 2, \$10.00.
Standard (Standard Co.), No. 1, \$10.00; No. 2, \$10.00.
Kingston (Standard Co.), No. 1, \$10.00; No. 2, \$10.00.
Acme (Standard Co.), No. 1, \$10.00; No. 2, \$10.00.
Duplex (Standard Co.), No. 1, \$10.00; No. 2, \$10.00.
Rival (Standard Co.), No. 1, \$10.00; No. 2, \$10.00.
Triumph (T. & S. Mfg. Co.), No. 1, \$10.00; No. 2, \$10.00.
Advance No. 1, No. 1, \$10.00; No. 2, \$10.00.
Advance No. 2, No. 1, \$10.00; No. 2, \$10.00.
Bryant's, No. 1, \$10.00; No. 2, \$10.00.
Ayres' Spiral, No. 1, \$10.00; No. 2, \$10.00.
Paine, Diehl & Co's, No. 1, \$10.00; No. 2, \$10.00.
Electric Bell Sets, No. 1, \$10.00; No. 2, \$10.00.
Bigelow & Dowse, No. 1, \$10.00; No. 2, \$10.00.

Embossed and Tinned Ware—See Hollow Ware.
Escutcheon Pins.
Iron, list Nov. 11, 1885, No. 1, \$10.00; No. 2, \$10.00.
Brass, No. 1, \$10.00; No. 2, \$10.00.

Escutcheons.
Door Lock, No. 1, \$10.00; No. 2, \$10.00.
Brass, No. 1, \$10.00; No. 2, \$10.00.
Wood, No. 1, \$10.00; No. 2, \$10.00.

Fenders.
Fenn's, No. 1, \$10.00; No. 2, \$10.00.
Bohren's Patent Rubber Ball, No. 1, \$10.00; No. 2, \$10.00.
Fenn's Cork Stops, No. 1, \$10.00; No. 2, \$10.00.
Star, No. 1, \$10.00; No. 2, \$10.00.
Frary's Patent Petroleum, No. 1, \$10.00; No. 2, \$10.00.
Wood's Patent Key, No. 1, \$10.00; No. 2, \$10.00.
Anchor Lock, No. 1, \$10.00; No. 2, \$10.00.
Metallic Key, Leather Lined, No. 1, \$10.00; No. 2, \$10.00.
Cork Lined, No. 1, \$10.00; No. 2, \$10.00.
Burnside's Red Cedar, No. 1, \$10.00; No. 2, \$10.00.
Burnside's Red Cedar, bbl. lots, No. 1, \$10.00; No. 2, \$10.00.
J. Sommer's Best Rock Tin Key, No. 1, \$10.00; No. 2, \$10.00.
J. Sommer's Cork Lined, list quality, No. 1, \$10.00; No. 2, \$10.00.
J. Sommer's Diamond Lock, No. 1, \$10.00; No. 2, \$10.00.
J. Sommer's Perfection, Fla. Red Cedar, No. 1, \$10.00; No. 2, \$10.00.
J. Sommer's Goodenough Cedar, No. 1, \$10.00; No. 2, \$10.00.
Self-Measuring, Enterprise, No. 1, \$10.00; No. 2, \$10.00.
Self-Measuring, Lane's, No. 1, \$10.00; No. 2, \$10.00.
Self-Measuring, Victor, No. 1, \$10.00; No. 2, \$10.00.

Felloe Plates.
Felloe Plates, No. 1, \$10.00; No. 2, \$10.00.

Fifth Wheels—Derby and Cincinnati.
Fifth Wheels, No. 1, \$10.00; No. 2, \$10.00.

Files.
Domestic, No. 1, \$10.00; No. 2, \$10.00.
Best brands, No. 1, \$10.00; No. 2, \$10.00.
Good brands, No. 1, \$10.00; No. 2, \$10.00.
Fair brands, No. 1, \$10.00; No. 2, \$10.00.
Heller's Horse Rasps, No. 1, \$10.00; No. 2, \$10.00.

Imports.
J. & Riley Carr, No. 1, \$10.00; No. 2, \$10.00.
J. & Riley Carr Horse Rasps, No. 1, \$10.00; No. 2, \$10.00.
Moore & Gamble, No. 1, \$10.00; No. 2, \$10.00.
Butcher's list, No. 1, \$10.00; No. 2, \$10.00.
Stube, No. 1, \$10.00; No. 2, \$10.00.
Turton's, No. 1, \$10.00; No. 2, \$10.00.
Greaver's Horse Rasps, No. 1, \$10.00; No. 2, \$10.00.

Fluting Machines.

Knox, 4 1/2-inch Rolls, No. 1, \$10.00; No. 2, \$10.00.
Knox, 6-inch Rolls, No. 1, \$10.00; No. 2, \$10.00.
Eagle, 3 1/2-inch Roll, No. 1, \$10.00; No. 2, \$10.00.

Crown Jewels.
Crown Jewels, No. 1, \$10.00; No. 2, \$10.00.

American, 5-in., 6-in., 7-in., 8-in., 9-in., 10-in., 11-in., 12-in., 13-in., 14-in., 15-in., 16-in., 17-in., 18-in., 19-in., 20-in., 21-in., 22-in., 23-in., 24-in., 25-in., 26-in., 27-in., 28-in., 29-in., 30-in., 31-in., 32-in., 33-in., 34-in., 35-in., 36-in., 37-in., 38-in., 39-in., 40-in., 41-in., 42-in., 43-in., 44-in., 45-in., 46-in., 47-in., 48-in., 49-in., 50-in., 51-in., 52-in., 53-in., 54-in., 55-in., 56-in., 57-in., 58-in., 59-in., 60-in., 61-in., 62-in., 63-in., 64-in., 65-in., 66-in., 67-in., 68-in., 69-in., 70-in., 71-in., 72-in., 73-in., 74-in., 75-in., 76-in., 77-in., 78-in., 79-in., 80-in., 81-in., 82-in., 83-in., 84-in., 85-in., 86-in., 87-in., 88-in., 89-in., 90-in., 91-in., 92-in., 93-in., 94-in., 95-in., 96-in., 97-in., 98-in., 99-in., 100-in., 101-in., 102-in., 103-in., 104-in., 105-in., 106-in., 107-in., 108-in., 109-in., 110-in., 111-in., 112-in., 113-in., 114-in., 115-in., 116-in., 117-in., 118-in., 119-in., 120-in., 121-in., 122-in., 123-in., 124-in., 125-in., 126-in., 127-in., 128-in., 129-in., 130-in., 131-in., 132-in., 133-in., 134-in., 135-in., 136-in., 137-in., 138-in., 139-in., 140-in., 141-in., 142-in., 143-in., 144-in., 145-in., 146-in., 147-in., 148-in., 149-in., 150-in., 151-in., 152-in., 153-in., 154-in., 155-in., 156-in., 157-in., 158-in., 159-in., 160-in., 161-in., 162-in., 163-in., 164-in., 165-in., 166-in., 167-in., 168-in., 169-in., 170-in., 171-in., 172-in., 173-in., 174-in., 175-in., 176-in., 177-in., 178-in., 179-in., 180-in., 181-in., 182-in., 183-in., 184-in., 185-in., 186-in., 187-in., 188-in., 189-in., 190-in., 191-in., 192-in., 193-in., 194-in., 195-in., 196-in., 197-in., 198-in., 199-in., 200-in., 201-in., 202-in., 203-in., 204-in., 205-in., 206-in., 207-in., 208-in., 209-in., 210-in., 211-in., 212-in., 213-in., 214-in., 215-in., 216-in., 217-in., 218-in., 219-in., 220-in., 221-in., 222-in., 223-in., 224-in., 225-in., 226-in., 227-in., 228-in., 229-in., 230-in., 231-in., 232-in., 233-in., 234-in., 235-in., 236-in., 237-in., 238-in., 239-in., 240-in., 241-in., 242-in., 243-in., 244-in., 245-in., 246-in., 247-in., 248-in., 249-in., 250-in., 251-in., 252-in., 253-in., 254-in., 255-in., 256-in., 257-in., 258-in., 259-in., 260-in., 261-in., 262-in., 263-in., 264-in., 265-in., 266-in., 267-in., 268-in., 269-in., 270-in., 271-in., 272-in., 273-in., 274-in., 275-in., 276-in., 277-in., 278-in., 279-in., 280-in., 281-in., 282-in., 283-in., 284-in., 285-in., 286-in., 287-in., 288-in., 289-in., 290-in., 291-in., 292-in., 293-in., 294-in., 295-in., 296-in., 297-in., 298-in., 299-in., 300-in., 301-in., 302-in., 303-in., 304-in., 305-in., 306-in., 307-in., 308-in., 309-in., 310-in., 311-in., 312-in., 313-in., 314-in., 315-in., 316-in., 317-in., 318-in., 319-in., 320-in., 321-in., 322-in., 323-in., 324-in., 325-in., 326-in., 327-in., 328-in., 329-in., 330-in., 331-in., 332-in., 333-in., 334-in., 335-in., 336-in., 337-in., 338-in., 339-in., 340-in., 341-in., 342-in., 343-in., 344-in., 345-in., 346-in., 347-in., 348-in., 349-in., 350-in., 351-in., 352-in., 353-in., 354-in., 355-in., 356-in., 357-in., 358-in., 359-in., 360-in., 361-in., 362-in., 363-in., 364-in., 365-in., 366-in., 367-in., 368-in., 369-in., 370-in., 371-in., 372-in., 373-in., 374-in., 375-in., 376-in., 377-in., 378-in., 379-in., 380-in., 381-in., 382-in., 383-in., 384-in., 385-in., 386-in., 387-in., 388-in., 389-in., 390-in., 391-in., 392-in., 393-in., 394-in., 395-in., 396-in., 397-in., 398-in., 399-in., 400-in., 401-in., 402-in., 403-in., 404-in., 405-in., 406-in., 407-in., 408-in., 409-in., 410-in., 411-in., 412-in., 413-in., 414-in., 415-in., 416-in., 417-in., 418-in., 419-in., 420-in., 421-in., 422-in., 423-in., 424-in., 425-in., 426-in., 427-in., 428-in., 429-in., 430-in., 431-in., 432-in., 433-in., 434-in., 435-in., 436-in., 437-in., 438-in., 439-in., 440-in., 441-in., 442-in., 443-in., 444-in., 445-in., 446-in., 447-in., 448-in., 449-in., 450-in., 451-in., 452-in., 453-in., 454-in., 455-in., 456-in., 457-in., 458-in., 459-in., 460-in., 461-in., 462-in., 463-in., 464-in., 465-in., 466-in., 467-in., 468-in., 469-in., 470-in., 471-in., 472-in., 473-in., 474-in., 475-in., 476-in., 477-in., 478-in., 479-in., 480-in., 481-in., 482-in., 483-in., 484-in., 485-in., 486-in., 487-in., 488-in., 489-in., 490-in., 491-in., 492-in., 493-in., 494-in., 495-in., 496-in., 497-in., 498-in., 499-in., 500-in., 501-in., 502-in., 503-in., 504-in., 505-in., 506-in., 507-in., 508-in., 509-in., 510-in., 511-in., 512-in., 513-in., 514-in., 515-in., 516-in., 517-in., 518-in., 519-in., 520-in., 521-in., 522-in., 523-in., 524-in., 525-in., 526-in., 527-in., 528-in., 529-in., 530-in., 531-in., 532-in., 533-in., 534-in., 535-in., 536-in., 537-in., 538-in., 539-in., 540-in., 541-in., 542-in., 543-in., 544-in., 545-in., 546-in., 547-in., 548-in., 549-in., 550-in., 551-in., 552-in., 553-in., 554-in., 555-in., 556-in., 557-in., 558-in., 559-in., 560-in., 561-in., 562-in., 563-in., 564-in., 565-in

Best Anti-Friction.....dis 60¢
 Duplex (Wood Track).....dis 60¢
 Terry's Patent.....dis 60¢
 12.....dis 60¢
 Cronk's Patent.....No. 4, 12; No. 5, 14.40; No. 6, 18.50
 Wood Track Iron Clad.....ft. 104, dis 50¢10 to 50¢15
 Carrier Anti-Friction.....dis 50¢10 to 50¢15
 Architect.....set \$5.00, dis 20¢
 Eclipse.....dis 20¢10
 Felix.....dis 20¢10
 Richards.....dis 20¢10
 Lane's Steel Anti-Friction.....dis 40¢10 to 40¢15
 The Ball Bearing Door Hanger.....dis 20¢10 to 25¢10
 Warner's Patent.....dis 20¢10 to 25¢10
 Stearns' Anti-Friction.....dis 25¢10 to 25¢10
 Stearns' Challenge.....dis 40¢10 to 40¢15
 Faultless.....dis 40¢10 to 40¢15
 American.....set \$6; dis 20¢10 to 20¢15
 Rider & Wooster, No. 1, 62¢; No. 2, 75¢.....dis 40¢
 Paragon, Nos. 1, 2 and 3.....dis 40¢10 to 40¢15
 Paragon, Nos. 5, 6, 7 and 8.....dis 20¢10 to 20¢15
 Crescent.....dis 40¢10 to 40¢15
 Nickel Cast Iron.....dis 50¢
 Nickel, Malleable Iron and Steel.....dis 40¢

Harness Snaps.—See Snaps.

Hatchets.—List Jan. 1, 1888.

Isaiah Blood.....dis 35¢ to 40¢
 Hunt's Shingling Lath and Claw.....dis 40¢5 to 40¢10
 Hunt's Broad.....dis 40¢
 Buffalo Hammer Co.....dis 40¢10 to 40¢15
 Hurd's.....dis 40¢10 to 40¢15
 Verkes & Plumb.....dis 40¢10 to 40¢15
 Wm. Mann, Jr., & Co.....dis 50¢ to 50¢10
 Underhill Edge Tool Co.....dis 40¢10 to 40¢15
 Underhill's Haines and Bright goods.....dis 33¢4 to 33¢5
 C. Hammond & Son.....dis 40¢10 to 40¢15
 Simmons.....dis 35¢ to 40¢
 Kelly's.....dis 40¢10 to 40¢15
 Sargent & Co.....dis 50¢
 Ten Eyck Edge Tool Co.....dis 40¢10 to 40¢15
 Collins, following list.....dis 10¢
 Shingling, Nos. 1, 2, 3.....dis 50¢ to 50¢10
 Claw, Nos. 1, 2, 3.....dis 50¢ to 50¢10
 Lathing, Nos. 1, 2, 3.....dis 50¢ to 50¢10

Hay Knives.

Lightning.....Mfrs. price \$18 to \$25; Jobber's Extras \$25 to \$30
 Electric.....dis 17¢ to 30¢
 Gem.....dis 18¢ to 30¢5
 Wadsworth's.....dis 40¢7½ to 40¢10
 Carter's Needle.....dis \$11.50 to \$12.00
 Heath's.....dis \$13.50 to \$14.00

Hinges.

Wrought Iron Hinges—
 Strap and T.....dis 70¢10 to 70¢15
 Screw Hook and Eye.....dis 25¢ to 25¢10
 Strap.....dis 14 to 36 in. \$2.25 to \$2.50
 Heavy Welded Hook.....dis 8 to 12 in. \$2.25 to \$2.50
 14 in. & up.....dis 2.50 to 2.75
 Screw Hook and Eye.....dis 14 in. \$1.50 to \$1.75
 16 in. \$2.25 to \$2.50
 18 in. \$2.50 to \$2.75
 Rolled Blind Hinges, Nos. 33 and 34.....dis 50¢10 to 50¢15
 Rolled Blind Hinges, Nos. 33 and 34.....dis 50¢10 to 50¢15
 Rolled Plate.....dis 70¢10 to 70¢15
 Rolled Raised.....dis 70¢10 to 70¢15
 Plate Hinges, 8, 10, 12 in. \$4.00 to \$4.50
 "Providence" over 12 in. \$3.50 to \$4.00

Spring Hinges—
 Geer's Springs and Blank Butts.....dis 40¢
 Union Spring Hinge Co.'s list, March, 1888.....dis 30¢
 Acme and U. S.....dis 20¢
 Empire and Crown.....dis 20¢
 Hero and Monarch.....dis 50¢
 American, Gem, and Star, Japanned.....dis 20¢
 American, Gem, and Star, Bronzed.....dis 20¢
 Oxford, Bronze and Brass.....dis 20¢
 Barker's Double Acting.....dis 20¢10 to 20¢15
 Union Mfg. Co.....dis 20¢
 Bommer's.....dis 20¢
 Buckman's.....dis 15¢ to 20¢
 Chicago.....dis 30¢

Gate Hinges—
 Western.....dis \$4.40, dis 56¢
 N. E. Reversible.....dis \$7.00, dis 56¢
 N. E. Reversible.....dis \$5.50, dis 56¢10
 Clark's, Nos. 1, 2, 3.....dis 60¢10 to 60¢15
 N. Y. State.....dis \$5.00, dis 56¢10
 Automatic.....dis \$12.50, dis 50¢
 Common Sense.....dis \$4.50, dis 50¢
 Seymour's.....dis 45¢10 to 45¢15
 Shepard's, Nos. 1, 2, 4 and 5.....dis 60¢10 to 60¢15
 Shepard's, No. 3.....dis 60¢10 to 60¢15
 Reed's Latch and Hinges.....dis 50¢ sets 12, dis 50¢

Blind Hinges—
 Parker.....dis 75¢2 to 75¢5
 Palmer.....dis 50¢5 to 50¢10
 Seymour.....dis 70¢2 to 70¢5
 Nicholson.....dis 45¢10 to 45¢15
 Huffer.....dis 50¢
 Clark's, Nos. 1, 3, 5, 40 and 50.....dis 75¢10 to 75¢15
 Clark's Mortise Gravity.....dis 50¢
 Sargent's, Nos. 1, 3, 5, 11, 13.....dis 75¢10 to 75¢15
 Sargent's, No. 12.....dis 75¢10 to 75¢15
 Reading's Gravity.....dis 75¢10 to 75¢15
 Shepard's "No. 1".....dis 60¢10 to 60¢15
 Shepard's Niagara Gravity, Nos. 1, 3 and 5.....dis 80¢
 Shepard's Buffalo Gravity, Nos. 1, 3 and 5.....dis 80¢2½ to 80¢5
 Shepard's Champion Gravity No. 76.....dis 80¢10 to 80¢15
 Shepard's Steamboat Gravity, No. 10.....dis 80¢20 to 80¢25
 Shepard's Acme Lull & Porter.....dis 75¢5 to 75¢10
 Shepard's O. S. Lull & Porter.....dis 75¢10 to 75¢15
 Shepard's "Queen City" Reversible.....dis 70¢10 to 70¢15
 Clark's Lull & Porter, Nos. 0, 1, 1½, 2, 3, 4.....dis 75¢10 to 75¢15
 North's Automatic Blind Pictures, No. 2, for Wood, \$10.50; No. 3, for Brick, \$13.50.....dis 25¢2 to 25¢5

Hoes.

Handled—
 Garden, Mortar, &c.....dis 65¢5 to 65¢10
 Planter's, Cotton, &c.....dis 65¢5 to 65¢10
 Warren Hoe.....dis 60¢
 Magic.....dis \$4.75
Eye—
 D. & H. Scovill.....dis 15¢
 Lane's Crescent Scovill Pattern.....dis 45¢
 Lane's Crescent Planters Pattern.....dis 45¢
 Lane's Razor Blade, Scovill Pattern.....dis 30¢
 Maynard, S. & O. Pat.....dis 60¢
 Sandusky Tool Co., S. & O. Pat.....dis 60¢
 Hubbard & Co., " ".....dis 60¢
 Bare " ".....dis 60¢
 Grub " ".....dis 60¢ to 60¢10

Hog Rings and Ringers.

Hill's Improved Ringers.....dis \$5.50 to \$5.75
 Hill's Old Style Ringers.....dis \$3.00 to \$3.25
 Hill's Tongs.....dis \$5.50 to \$6.00
 Hill's Rings.....dis \$2.00 boxes \$1.75 to \$2.00
 Perfect Rings.....dis \$2.00 boxes \$1.75 to \$2.00
 Perfect Ringers.....dis \$2.00
 Blair's Hog Ringers.....dis \$2.00
 Blair's Hog Rings.....dis \$2.00

Champion Ringers.....dis \$2.00
 Champion Rings, Double.....dis \$2.25
 Brown's Ringers.....dis \$2.00
 Brown's Rings.....dis \$1.25 to \$1.50

Hoisting Apparatus.

"Moore's" Hand Hoist, with Lock Brake.....dis 15¢
 "Moore's" Differential Pulley Block.....dis 20¢

Holders, Tool.

Bals Pat.....dis \$4; dis 25¢

Hollow-Ware.

Stove Hollow-Ware, Ground.....dis 60¢10 to 60¢10½
 Stove Hollow-Ware, Unground.....dis 70¢10 to 70¢10½
 Enamelled and Tinned Hollow-Ware—
 Kettles.....dis 70¢10 to 70¢15
 Oval Boilers, Saucepans & Glue Pots.....dis 40¢10 to 40¢15
 Gray Enamelled Ware.....dis 10¢ to 40¢5
 Agate and Granite Ware.....dis 25¢
 Rustless Hollow-Ware.....dis 50¢ to 50¢5
 Galvanized Tea-Kettles—
 Inch.....dis 55¢
 Each.....dis 60¢
 8.....dis 75¢
 9.....dis 75¢

Silver Plated.

Reed & Barton.....dis 40¢5 to 40¢10
 Meriden Britannia Co.....dis 40¢5 to 40¢10
 Simpson, Hall, Miller & Co.....dis 40¢5 to 40¢10
 Rogers & Brother.....dis 40¢5 to 40¢10
 Hartford Silver Plate Co.....dis 40¢5 to 40¢10
 William Rogers Mfg. Co.....dis 40¢5 to 40¢10

Hooks.

Cast Iron—
 Bird Cage, Sargent's list.....dis 40¢10 to 40¢15
 Bird Cage, Reading.....dis 60¢10 to 60¢15
 Clothes Line, Sargent's list.....dis 60¢10 to 60¢15
 Clothes Line, Reading list.....dis 60¢10 to 60¢15
 Ceiling, Sargent's list.....dis 55¢10 to 55¢15
 Harness, Reading list.....dis 55¢10 to 55¢15
 Coat and Hat, Sargent's list.....dis 55¢10 to 55¢15
 Coat and Hat, Reading.....dis 50¢10 to 50¢15

Wrought Iron—

Cotton.....dis \$1.25
 Cotton Pat. N. Y. Mallet & Handle Wks.....dis 30¢
 Tassel and Picture (T. & S. Mfg. Co.).....dis 50¢
 Wrought Staples, Hooks, &c.....dis 50¢
 Bench Hooks.....dis 50¢

Wire—

Wire Coat and Hat, Gem, list April, 1888.....dis 45¢
 Wire Coat and Hat, Miles, list April, 1888.....dis 45¢
 Indestructible Coat and Hat.....dis 45¢
 Belt.....dis 75¢10 to 80¢
 Grass.....dis 20¢
 Bush.....dis 55¢ to 60¢
 Whiffles Patent.....dis 55¢
 Hooks and Eyes—Malleable Iron.....dis 70¢
 Hooks and Eyes—Brass.....dis 60¢10 to 60¢15
 Fish Hooks, American.....dis 50¢

Horse Nails.

Nos. 6, 7, 8, 9, 10
 Anable.....dis 25¢ to 25¢10
 Clinton, Fin.....dis 25¢ to 25¢10
 Essex.....dis 25¢ to 25¢10
 Putnam.....dis 25¢ to 25¢10
 Vulcan.....dis 25¢ to 25¢10
 Northwest.....dis 25¢ to 25¢10
 Giope.....dis 25¢ to 25¢10
 A. C.....dis 25¢ to 25¢10
 C. B. K.....dis 25¢ to 25¢10
 Champlain.....dis 25¢ to 25¢10
 New Haven.....dis 25¢ to 25¢10
 Saranac.....dis 25¢ to 25¢10
 Champion.....dis 25¢ to 25¢10
 Capewell.....dis 25¢ to 25¢10
 Star.....dis 25¢ to 25¢10
 Anchor.....dis 25¢ to 25¢10
 Western.....dis 1¢ per lb., all sizes
 Empire Ironed.....dis 1¢ per lb.

Horse Shoes.—See Shoes, Horse.

Hose, Rubber, competition......dis 75¢10 to 80¢
 Standard.....dis 70¢10 to 70¢15
 Extra.....dis 60¢10 to 60¢15
 N. Y. R. & P. Co., Extra.....dis 50¢5 to 50¢10
 N. Y. R. & P. Co., Dundee.....dis 60¢10 to 60¢15

Ice Picks, Chisels, &c.

Am. Ice Chisel Pol'd.....dis \$3.00, dis 2¢ to 2¢5
 National Ice Chisel.....dis \$5.25, dis 20¢
 Novelty Ice Breakers.....dis \$5.25, dis 20¢
 Dunlap's Ring Picks.....dis \$5.00, dis 15¢
 Wood Head Picks, Sargent's.....dis \$1.50, dis 50¢10
 Iron Head Picks, Sargent's.....dis \$1.25, dis 50¢10
 Ice Axes, Pick in handle.....dis \$2.00, dis 15¢
 Ice Axes, Small Cast or Mail.....dis \$1.25, dis 20¢10
 Combination Ice Tools.....dis \$2.00 net
 Acme Ice Pick and Toned Knives.....dis 50¢10 to 50¢15
 Roger's Lightning Ice Chisel.....dis \$2.50 gross

Ice Tongs.

Champion, S. S. & Co.....dis \$4.00, dis 25¢10 to 25¢15
 Family.....dis \$2.75, dis 20¢25 to 20¢30

Jack Screws.—See Screws.

Kettles......Spun, Stamped.
 Brass 7 to 17 in. \$2.25 to \$2.50
 Brass larger than 17 inches \$2.50 to \$2.75
 Enamelled and Tea Kettles.....See Hollow-Ware

Keys.

Lock Ass'n list Dec. 30, 1887.....dis 50¢10 to 60¢5
 Eagle, Cabinet, Trunk and Padlock.....dis 33¢4 to 33¢5
 Hotchkiss' Brass Blanks.....dis 40¢
 Hotchkiss' Copper and Tinned.....dis 40¢
 Hotchkiss' Padlock and Cabinet.....dis 35¢
 Ratchet Bed Keys.....dis \$4.00, dis 15¢

Knife Sharpeners.

Parkin's Applewood Handles.....dis \$6.00, dis 40¢
 Parkin's Rosewood or Cocobolo.....dis \$9.00, dis 40¢

Knives.

Wilson's Butcher Knives.....dis 20¢ to 25¢
 Ames' Butcher Knives.....dis 25¢
 Nichols' Butcher Knives.....dis 40¢10
 Ames' Shoe Knives.....dis 20¢ to 25¢
 Ames' Bread Knives.....dis \$1.50, dis 15¢ to 20¢
 Moran's Shoe and Bread Knives.....dis 20¢
 Hay and Straw.....dis 20¢
 Table and Pocket.....dis 20¢

Knobs.

Door Mineral.....dis 65¢ to 70¢
 Door Por. Jap'd.....dis 75¢ to 80¢
 Door Por. Por. Nickel.....dis \$2.00 to \$2.25
 Door Por. Plated, Nickel.....dis \$2.00 to \$2.25
 Drawer, Porcelain.....dis 55¢10 to 55¢15
 Hemlock Door Knobs, new list.....dis 40¢10 to 40¢15
 Yale & Towne Wood Knobs, list Dec., 1887.....dis 40¢
 Furniture Plain.....dis 75¢ gross incl. dis 10¢
 Furniture, Wood Screws.....dis 25¢10 to 25¢15
 Base, Rubber Tip.....dis 70¢10 to 70¢15
 Picture, Judd's.....dis 60¢10 to 60¢15
 Picture, Sargent's.....dis 60¢10 to 60¢15
 Picture, Hemlock.....dis 55¢5 to 55¢10
 Shutter, Porcelain.....dis 65¢10 to 65¢15
 Carriage, Japanned.....dis \$5.00, dis 60¢10

Ladies.

Melting, Sargent's.....dis 55¢10 to 55¢15
 Melting, Reading.....dis 35¢10 to 35¢15
 Melting, Moore's Patens.....dis \$4.00, dis 40¢
 Melting, P. S. & W.....dis 35¢10 to 40¢
 Melting, Warner's.....dis 30¢

Lanterns.

Tabular, No. 9, without Guards.....dis \$5.75
 Tabular, Liftwire, No. 0, without Guards.....dis \$5.50
 Tabular, Hinge Tip, No. 0, without Guards.....dis \$5.25
 Tabular, Bottom Lift, without Guards.....dis \$5.25
 Tabular, U. S. Safety Lift Wire, no Guards.....dis \$5.00
 Guards for Tabulars, add \$1.00
 Police, Small, \$5.00; Med. \$7.25; Large, \$9.75, dis 20¢25 to 20¢30
 Porter's Tin R. R.....dis \$10 to \$12

Lemon Squeezers.

Porcelain Lined, No. 1.....dis \$6.00, dis 25¢30 to 25¢35
 Wood, No. 2.....dis \$3.00, dis 25¢
 Wood, Common.....dis \$1.70 to \$1.75
 Dunlap's Improved.....dis \$3.75, dis 20¢
 Sammis.....dis \$1.50, dis 25¢10 to 25¢15
 Jennings' "Star".....dis \$2.50
 The Boss.....dis \$2.50
 Dean's.....dis \$3.50, dis 35¢
 Little Giant.....dis \$5.00 to 50¢5
 King.....dis 40¢5 to 40¢10

Lines.

Cotton and Linen Fish, Draper's.....dis 50¢
 Draper's Chalk.....dis 60¢
 Draper's Mason's Linen, 84 ft., No. 1, \$1.25; No. 2, \$1.75; No. 3, \$2.25; No. 4, \$2.75; No. 5, \$3.25.....dis 25¢
 Cotton Chalk.....dis \$1.70 to \$1.75
 Samson, Cotton, No. 4, \$2; No. 4½, \$2.50.....dis 10¢
 Silver Lake, Braided, Nos. 0, \$6.00; No. 1, \$6.50; No. 2, \$7.00; No. 3, \$7.50 gross.....dis 25¢
 Mason's Linen, No. 3½, \$1.50; No. 4, \$2; No. 4½, \$2.50
 Mason's Colored Cotton.....dis 45¢
 Wire Clothes, No. 18, \$3.75; No. 19, \$3.25; No. 20, \$2.75
 Ventilator Cord, 3 unison Braided.....dis \$7.50 gross, dis 20¢

Locks, Padlocks, Cabinet Locks, &c.

Door Locks, Latches, &c.—
 List, Dec. 30, '87, chgd Feb. 2, '88.....dis 50¢10 to 60¢5
 Note.—Lower net prices often made
 Reading Hardware Co. (list Feb. 2, '88).....dis 55¢
 Livingston & Co.....dis 70¢
 Perkins' Burglar Proof.....dis 60¢25 to 60¢30
 Plate.....dis 33¢4 to 33¢5
 "Champion" Extension Cylinder.....dis \$10.50 gross
 Barnes Mfg. Co.....dis 40¢
 Yale Corrugated Key.....dis 33¢4 to 33¢5
 Diets Flat Key.....dis 30¢
 L. & C. Round Key Latches.....dis 30¢10 to 30¢15
 L. & C. Flat Key Latches.....dis 33¢4 to 33¢5
 Romer's Night Latches.....dis 30¢
 Yale new list.....dis 33¢4 to 33¢5
 "Shepherd" or "U. S.".....dis 35¢
 "Felter" or "American".....dis 40¢10
 Seed's N. Y. Hasp Lock.....dis 25¢

Cabinets.

Eagle, Gaylord Parker and } List March, '84, revised
 Corbin.....dis 33¢4 to 33¢5
 Deits, Nos. 36 to 39.....dis 40¢
 Deits, Nos. 51 to 63.....dis 40¢10 to 40¢15
 Deits, Nos. 86 to 98.....dis 30¢
 Stoddard Lock Co.....dis 30¢ to 33¢4
 "Champion" Night Latches.....dis 40¢
 Barnes Mfg. Co.....dis 40¢
 Eagle and Corbin Trunk.....dis 25¢2 to 25¢3
 "Champion" Cabinet and Combination.....dis 33¢4 to 33¢5
 Yale.....dis 33¢4 to 33¢5
 Romer's.....dis 25¢

Padlocks.

List, Dec. 23, '84.....dis 55¢10 to 55¢15
 Yale Lock Mfg. Co. s.....dis 33¢4 to 33¢5
 Eagle.....dis 25¢2 to 25¢3
 Romer's, Nos. 0 to 91.....dis 30¢
 Romer's, Nos. 200 to 506.....dis 20¢
 A. E. Deits.....dis 40¢
 "Champion" Padlocks.....dis 40¢
 Hotchkiss.....dis 30¢
 Hotchkiss.....dis 15¢
 "Horse Shoe" \$2.00.....dis 40¢
 Barnes Mfg. Co.....dis 40¢
 No. 1's.....dis 30¢
 Brown's Patent.....dis 25¢
 Scandinavian.....dis 40¢
 Frain's Pat. Scandinavian new list (owl).....dis 60¢

Lumber Tools.

Ring Peavies, "Blue Line" Finish.....dis \$20.00
 Ring Peavies, Common Finish.....dis \$18.00
 Steel Socket Peavies.....dis \$21.00
 Mail, Iron Socket Peavies.....dis \$19.00
 Cant Hooks, "Blue Line" Finish.....dis \$16.00
 Cant Hooks, Common Finish.....dis \$14.00
 Cant Hooks, Mail, Socket Clasp, "Blue Line" Finish.....dis \$16.00
 Cant Hooks, Mail, Socket Clasp, Common.....dis \$14.50
 Cant Hooks, Clip Clasp, "Blue Line" Fin.....dis \$12.00
 Cant Hooks, Clip Clasp, Common Finish.....dis \$11.00
 Hand Spikes.....dis \$6 ft. \$15.00; 8 ft., \$20
 Pike Poles, Pike & Hook, 12 ft. 14 ft. 16 ft. 18 ft. 20 ft.
 \$11.50 12.50 14.50 17.50 21.50
 Pike Poles, Pike only.....dis 10.00 11.00 13.00 16.00 20.00
 Pike Poles, not ironed, \$
 6.00 7.00 9.00 12.00 16.0
 Setting Poles, \$ dos.....dis 14.00 15.00 17.00
 Wamp Hooks.....dis \$18.00
 Landing Blocks.....dis \$22.50
 Skidding Tongs.....dis \$51.00
 Log Binders.....dis \$26.00
 Banded Boot Calks, 1 to 5 M, dis 25¢; 5 to 10 M, dis 30¢
 Square Steel Boot Calks.....dis 40¢
 Chain Rafting Dogs.....dis \$100 to \$125
 Ring Rafting Dogs.....dis \$100, med., \$10.00; large, \$12.00
 Timber Grapples.....dis \$30.00

Lustre.

Four-ounce Bottles.....dis \$1.75 gross, \$17.00

Mallets.

Hickory.....dis 20¢10 to 20¢15
 "Gramvite".....dis 20¢10 to 20¢15
 B. & L. Block Co., Hickory and L. V.....dis 30¢ to 39¢10

Mattocks.—Regular list......dis 60¢5 to 60¢10

Meat Cutters.

Dixon's—New.....dis 1 2 3 4
 \$14.00 17.00 19.00 30.00—dis 45¢
 Woodruff's.....dis \$15.00 18.00—dis 45¢
 Champion.....dis \$20.00 30.00 40.00—dis 45¢
 Hales' Pattern Nos. 11 12 13
 \$27.00 33.00 45.00—dis 70¢
 American.....dis 1 2 3 4B
 \$5.00 7.00 10.00 25.00 50.00 60.00
 Enterprise.....dis \$10 to \$12
 \$3 0¢ 2 50 1 00 0 50 1 00

Pennsylvania.....dis 40&10%
Nos.....dis 40
* dos.....\$24.00 28.00 36.00 28.00
Miles' Challenge, Nos. 1 2
* dos.....\$22.00 30.00 40.00—dis 45&45&10%
Home No. 1.....\$26 * dos, dis 55&10%
Draw Cut, Nos. 6 7 8
Each.....\$50.00 75.00 80.00 225.00—dis 20 @ 25%
Beef Shavers (Enterprise Mfg. Co.).....dis 20&10 @ 30%
Chadborn's Smoked Beef Cutter.....* dos, \$68.00

Mining Knives.
Am. (2d quality), * gro, 1 blade, \$7; 2 blades, \$12; 3 blades, \$18.
Lothrop's.....* dos, \$12.00
Smith's, * dos, Single, \$2.00; Double, \$3.....dis 40&45%
Knapp & Cowles.....dis 50&10&60%

Melanes Gages.—Stebbins' Pat. dis 70&70 & 7 1/2%
Stebbins' Genuine.....dis 60&10&10%
Stebbins' Tinned Ends.....dis 40&10%
Chase's Hard Metal.....dis 50&10%
Bush's.....dis 20%
Lincoln's Pattern.....dis 65&10%
Weed's.....dis 20&10%
Rose Nos. 1 2 3 4
\$7.00 8.00 9.00 10.00. * dos, dis 60&10&10%

Money Drawers.—* dos, \$18 @ \$20.
Muzzles.—Safety, * dos, \$3.....dis 25%

Nails.—See Trade Report
Wire nails, list July 14, '87.....dis 70 @ 70&10%
Wire Nails, Standard Penna.....* keg, \$2.75 @ \$2.85
Nail Puller.—Jurtiss Hammer.....* dos \$8.00 net
Giant, No. 1.....* dos \$30.00, dis 10%
Pellon.....* dos \$3.00, dis 25%
Boss.....* dos \$30, dis 30%
Nail Sets.—Square.....* gro, \$4.00 @ \$4.25
Round.....* gro, \$3.25
Cannon's Diamond Point.....* gro, \$12 dis 20%

Nut Crackers.
Table (Humason & Beckley Mfg. Co.).....dis 40%
Blake's Pattern.....* dos \$2.00, dis 10%
Turner & Seymour Mfg. Co.....dis 50%
Nuts and Washers.
Size.....1/4 5-16 3/8 1/2 5/8 3/4 7/8 1 1 1/4 1 1/2 1 3/4 2
Washers.....5/16 3/8 1/2 5/8 3/4 7/8 1 1 1/4 1 1/2 1 3/4 2
Nuts, all kinds, 5¢ off list.....dis 70 @ 70&10%
In lots less than 100 lb, * do, add 1/2¢, 1 lb boxes add 1¢ to list.

Oakum.
U. S. Navy.....* \$14¢
U. S. Navy.....* \$7¢
Navy.....* \$7¢

Oil.—Zinc and Tin.....dis 65 @ 65&10%
Brass and Copper.....dis 60&10&50&10&50%
Malleable, Hammers, Improved, No 1, \$3.00; No 2, \$4.00; No 3, \$4.40 * dos.....dis 10 @ 10&10%
Malleable, Hammers, Old Pattern, same list.....dis 40%
Prior's Patent or "Paragon" Zinc.....dis 50%
Olmstead's Tin and Zinc.....dis 60%
Olmstead's Brass and Copper.....dis 60%
Broughton's Zinc.....dis 60%
Broughton's Brass.....dis 50%

Packing, Steam.
Rubber—
Standard.....dis 60&10 @ 60&10&10%
Extra.....dis 50&10 @ 60%
N. Y. B. & P. Co. Standard.....dis 50&10&50%
N. Y. B. & P. Co. Empire.....dis 70%
N. Y. B. & P. Co. Salamander.....dis 30%
Jenkins' Standard.....* \$8.00, dis 35%

Miscellaneous.
American Packing.....10¢ @ 11¢ * do
Russia Packing.....14¢ * do
Italian Packing.....13¢ @ 14¢ * do
Cotton Packing.....15¢ @ 17¢ * do
Jute.....7¢ @ 8¢ * do

Padlocks.—See Locks.
Pails.
Galvanized Iron—
Quarts.....10 12 14
Hill's Light Weight, * dos.....\$2.75 3.00 3.25
Hill's Heavy Weight, * dos.....3.00 3.25 3.75
Whiting's.....2.75 3.00 3.25
Sidney Shepard & Co.....2.67
Iron Clad.....2.75 3.00 3.25
Fire Buckets.....2.75 3.25 3.50
Buckets, see Wall Buckets

Indurated Fibre Ware.
Star Pails, 12 qt.....* dos \$1.50
Fire, Stable and Milk, 14 qt.....* dos \$5.50

Penolds Faber's Carpenters......high list, dis 50%
Faber's Round Gilt.....* gro \$5.25 net
Dixon's Lead.....* gro \$4.50 net
Dixon's Lead.....* gro \$6.75 net
Dixon's.....dis 40&10%

Picks.
Railroad, 5 to 6, \$12.00; 6 to 7, \$13.....dis 60 @ 60&10%
Adze Eye, 5 to 6, \$12.00; 6 to 7, \$13.....dis 60 @ 60&10%

Picture Nails.
Brass Head, Sargent's list.....dis 50&10&10%
Brass Head, Combination list.....dis 60&10%
Porcelain Head, Sargent's list.....dis 50&10&10%
Porcelain Head, Combination list.....dis 40&10%
Niles' Patent.....dis 40%

Pinking Irons......* dos 65¢ net
Pipe, Wrought Iron.—List March 23, 1887.
1 1/4 and under, Plain.....dis 52 1/2%
1 1/4 and under, Galvanized.....dis 42 1/2%
1 1/4 and over, Plain.....dis 65%
1 1/4 and over, Galvanized.....dis 52 1/2%
Boiler Tubes, Iron.....dis 55%

Planes and Plane Irons.
Wood Planes.
Molding.....dis 50 @ 50&5%
Bench, First Quality.....dis 60 @ 60&5%
Bench, Second Quality.....dis 60&10%
Bailley's (Stanley R. & L. Co.).....dis 30&10%

Iron Planes.
Bailley's (Stanley R. & L. Co.).....dis 30&10&30&10&5%
Miscellaneous Planes (Stanley R. & L. Co.).....dis 20&10%
Victor Planes (Stanley R. & L. Co.).....dis 20&10%
Steer's Iron Planes.....dis 35 @ 35&5%
Meriden Mal. Iron Co.'s.....dis 30&10&30&10&10%
Davis's Iron Planes.....dis 30&10&10&10%
Birmingham Plane Co.....dis 50&50&5%
Gage Tool Co.'s Self-Setting.....dis 25%

Plane Irons.
Plane Irons.....dis 20&10%
Plane Irons, Butcher's.....\$5.00 @ \$5.25 to 2
Plane Irons, Buck Bros.....dis 30%
Plane Irons, Middlesex Mfg. Co., "Baldwin" iron.....dis 20 @ 25%
Single and Cut.....dis 33 1/2 @ 40%
L. & J. White.....dis 25%

Pliers and Nippers.
Button's Patent.....dis 30&10 @ 40%
Hall's Pat. Compound Lever Cutting Nippers, No. 2, 3 in., \$13.50; No. 4, 7 in., \$21.00 * dos dis 20&10&20&10%
Humason & Beckley Mfg. Co.....dis 50&50&10%

Gas Pliers......dis 60%
Gas Pliers, Foster's Nickel Plated.....dis 60&5%
Sureka Pliers and Nippers.....dis 40%
Russell's Parallel.....dis 25%
P. S. & W. Cast Steel.....dis 50%
P. S. & W. Tinner's Cutting Nippers.....add 6% dis 10%
Carew's Pat. Wire Cutters.....dis 20%
Morrell's Parallel, per doz., \$12.....dis 30&5%
Cronk's 6 in., \$15; 10 in., \$21.....dis 40%

Plumbs and Levels.
Regular List.....dis 70&10&70&10&10%
Diction's.....dis 45&10%
Pocket Levels.....dis 70&10&70&10&10%
Davis Iron Levels.....dis 30%
Davis' Inclinoimeters.....dis 10&10%

Poppers, Corn.
Round or Square, 1 qt.....* gro \$10.50 @ \$12
Round or Square, 2 qt.....* gro \$25.50 @ \$24
Post Hole and Tree Augers and Diggers.
Samson Post Hole Digger.....* dos \$36.00, dis 25&10%
Fletcher Post Hole Augers.....* dos \$36.00, dis 20%
Sureka Diggers.....* dos \$16 @ \$17
Leed's.....* dos \$8.00 @ \$9.00
Vaughan's Post Hole Auger, per doz., \$24.00.....dis 40%
Kohler's Little Giant.....* dos \$18.00
Kohler's Hercules.....* dos \$15.00
Kohler's New Champion.....* dos \$9.00
Schneider.....* dos \$18
Ryan's Post Hole Diggers.....* dos \$24
Cronk's Post Hole.....* dos \$60, dis 50&5% @ 50&10%
Gibb's Post Hole Digger, * dos \$30.....dis 40 @ 40&10%

Potato Parers.
White Mountain.....* dos \$5.00 @ 5.50
Antrim Combination.....* dos \$8.00
Hoosier.....* dos \$13.50

Pruning Hooks and Shears.
Diction's Combined Pruning Hook and Saw, * dos \$18.00.....dis 20&10%
Diction's Pruning Hook.....* dos \$12.00, dis 20&10%
E. S. Lee & Co.'s Pruning Tools.....dis 40%
Pruning Shears, Henry's Pat.....* dos \$3.75 @ \$4.00 net
Henry's Pruning Shears.....* dos \$4.25 @ \$4.50 net
Wheeler, M. & Co.'s Combination.....* dos \$12, dis 20%
Dunlap's Saw and Chisel.....* dos \$5.50, dis 20%
J. Mallinson & Co., No. 1, \$5.25; No. 2, \$7.25

Pulleys.—Hot House, Awnings, etc.....dis 60&10%
Japanned Screw.....dis 60&10%
Brass Screw.....dis 60&10%
Japanned Side.....dis 60&10%
Japanned Clothes Line.....dis 60&10%
Empire Sash Pulley.....dis 55 @ 60%
Hay Fork, Solid Eye, \$4.00; Swivel, \$4.50.....dis 50&10%
Hay Fork, "Anti-Friction," 5 in. Solid, \$5.70.....dis 50%
Hay Fork, "F" Common and Pat. Bushed.....dis 20%
Hay Fork, Tarbox Pat. Iron.....dis 20%
Hay Fork, Reed's Self-Lubricating.....dis 60%
Snade Rack.....dis 45%

Pumps.—Clsters, Best Makers.....dis 50 @ 10&80%
Pitcher Spout, Best Makers.....dis 60&10 @ 60&10&10%
Pitcher Spout, Cheaper Goods.....dis 70&5 @ 70&10&5%
Punches.
Saddlers' or Drive, good quality.....* dos 60¢ @ 65¢
Bemis & Call Co.'s Cast Steel Drive.....dis 50&5%
Bemis & Call Co.'s Springfield Socket.....dis 60&5%
Spring, good quality.....* dos \$2.50 @ \$2.60
Spring, Leach's Patent.....dis 15%
Bemis & Call Co.'s Spring and Check.....dis 40%
Solid Tinner's.....* dos \$1.44, dis 55%
Tinner's Hollow Punches.....dis 20&10%

Rail.
Sliding Door, Wrt. Brass * \$35, dis 20 @ 20&5%
Sliding Door, Bronzed Wrt. Iron.....* foot 74
Sliding Door Iron, Painted.....* foot 44, dis 20&10&5%
Sarn Door, Light.....Inch.....\$3.50 3.00 4.40—dis 10%
B. D. for N. E. Hangers—
Per 100 feet.....Small Med. Large
\$2.15 2.70 3.25 net

**Terry's Wrought Iron, * foot.....44¢ @ 5¢
Victor Trunk Rail 7 1/2 in. front.....dis 50¢ @ 5¢
Carrier Steel Rail, per foot.....44¢**

Rakes.
Cast Steel.....dis 65&5 @ 70%
Walleable.....dis 70 @ 70&5%
Gibbs Lawn Rake.....\$12, dis 40%
Canton Lawn Rake.....\$9, dis 40%
Ft. Madison Prize Bow Brace and Peenies.....dis 65&5%
Fort Madison Steel Tooth Lawn Rake, \$6.....dis 25%

Razors.—J. R. Torrey Razor Co.....dis 20%
Wootenholme and Butcher.....\$10 to \$4, dis 10%

Razor Straps.
Genuine Emerson.....dis 60 @ 60&5%
Imitation Emerson.....* dos \$2.00, dis 20&10&5%
Torrey's.....dis 20%
Badger's Belt and Combination.....* dos \$2
Lamont Combination.....* dos \$4

Rivets and Burrs.
Copper.....dis 50, with Jobbers' Extras
Iron, list November 17, 1887.....dis 50%

Rivet Nuts......dis 50&2 @ 50&10%
Rods.—Stair, Brass.....dis 20&2%
Stair, Black Walnut.....* dos 40%

Rollers.
Barn Door, Sargent's list.....dis 60&10&10%
Acme (Anti-Friction).....dis 55%
Union Barn Door Roller.....dis 70%

Rope.—Manufacturers' prices for large lots.
Manila.....1/4 inch and larger * \$10 1/2¢ net
Manila.....1/2 inch * \$11 1/2¢ net
Manila.....3/4 and 5-16 inch * \$11 1/2¢ net
Manila Tarred Rope.....* \$10 1/2¢ net
Sisal.....1/4 inch and larger * \$9 1/2¢ net
Sisal.....1/2 inch * \$10 1/2¢ net
Sisal.....3/4 and 5-16 inch * \$10 1/2¢ net
Sisal, Hay Rope.....* \$9 1/2¢ net
Sisal, Tarred Rope.....* \$9 1/2¢ net
Sisal, Medium Lath Yarn.....* \$8 1/2¢ net
Cotton Rope.....* \$15 @ 18¢ net
Jute Rope.....* \$7

Rules.
Boxwood.....dis 80&10 @ 80&10&10%
Ivory.....dis 50 @ 55&10%

Sad Irons.
From 4 to 10, at factory.....* 100 lb \$2.75 @ \$2.85
Self-Heating, Tailors'.....* dos \$18.00 net
Gleason's Silt and Follet.....dis 25%
Mrs. Pot's Irons.....dis 40&40&5%
Enterprise Star Irons, new list, July 20, 1887.....dis 40%
Combined Pluter and Sad Iron.....* dos \$15.00, dis 15%
Fox Reversible, Self-Heating.....* dos \$24.00 net
Chinese Laundry (N. E. Butt Co.).....\$4 1/2, dis 15%
New England.....\$5, dis 15%
Mahony's Troy Pol. Irons.....dis 25%

Sand and Emery Paper and Cloth.
List April 19, 1888.....dis 20 @ 20&5%
Sibley's Emery and Crocus Cloth.....dis 30%

Sash Cord.
Common.....* \$10 @ 11¢
Patent, good quality.....* \$13 @ 13 1/2¢
White Cotton Braided, fair quality.....* \$28 @ 29¢
Common Russia Sash.....* \$13 1/2¢

**Patent "Cable Laid Italian".....* \$15¢
India Cable Laid.....* \$22 @ 23¢
Silver Lake, A Quality, White.....50¢, dis 10&10&5%
Silver Lake, A Quality, Drab.....55¢, dis 10&10&5%
Silver Lake, B Quality, White.....50¢, dis 20&10&5%
Silver Lake, B Quality, Drab.....55¢, dis 20&10&5%
Silver Lake, C Quality, White (only).....\$7 @ 8¢
Sylvan Spring, Extra Braided, White.....39¢
Sylvan Spring, Extra Braided, Drab.....39¢
Semper Idem, Braided, White.....30¢
Egyptian, India Hemp, Braided.....25¢
Samson, Braided, White Cotton.....50¢ dis 30 @ 30&5%
Samson, Braided, Drab Cotton.....50¢ dis 30 @ 30&5%
Samson, Braided, Italian Hemp.....55¢ dis 30 @ 30&5%
Samson Braided Linen.....30¢ dis 30 @ 30&5%**

Sash Locks.
Clark's No. 1, \$10.00; No. 2, \$8.00 * gross.....dis 33 1/2%
Ferguson's.....dis 33 1/2%
Morris and Triumph, list Aug. 16, 1886.....dis 60&22%
Victor.....60¢ dis 10&2%
Walkers.....dis 10%
Attwell Mfg. Co.....dis 25 @ 33 1/2%
Reading.....dis 60 1/2 @ 60 1/2&10%
Hammond's Window Springs.....dis 40%
Common Sense, Jap. d. Cop'd and Br'd.....* gross \$1.00
Common Sense, Nickel Plated.....* gross \$1.00
Universal.....dis 30%
Kempshall's Gravity.....dis 60%
Kempshall's Model.....dis 60&60&10%
Corbin's Daisy, list February 15, 1886.....dis 70%
Parson's Perfect.....dis 50&10&5% @ 50%
Hugunin's New and Improved Adjustable Sash Balances, list Jan. 5, 1887.....dis 25&22%
Hugunin's New Sash Locks, list Jan. 6, '87, dis 25&22%
Stoddard "Practical".....dis 10%
Ives Patent.....dis 55 @ 55&5%
Liesche's Nos. 100 & 110 * gro. \$3; 105, \$10, dis 20&10%
Davis, Bronze, Barnes Mfg. Co.....dis 50%

Sash Weights......* ton. \$35
Solid Eyes.....* ton. \$35

Sawage Stuffers or Fillers.
Miles' "Challenge".....* dos \$30, dis 50&50&5%
Perry.....* dos. No. 1, \$15; No. 2, \$21, dis 50&50&5%
Draw Cut No. 4.....each, \$30.00, dis 30%
Enterprise Mfg. Co.....dis 20&10 @ 30%
Silver.....dis 40&10%

Saws.
Diction's Circular.....dis 45&45&5% Extras some dis 45%
Diction's Cross Cuts, dis 45&45&5% gives some by Diction's Hand.....dis 25&25&5% jobbers.
Atkins' Circular.....dis 50%
Atkins' Silver Steel Diamond X Cuts.....* foot 75%
Atkins' Concave Tooth Dexter X Cuts.....* foot 55%
Atkins' Special Steel Diamond X Cuts.....* foot 32%
Atkins' Champion and Electric Tooth X Cuts.....* foot 80%

Atkins' Hollow Back X Cuts.....* foot 21 @ 22%
Atkins' Shingle, Mulay, Drag, etc.....* foot 27&28%
W. M. & C. Hand.....dis 30&5 @ 30&10%
W. M. & C. Champion X Cuts, Regular * foot. 24&25%
W. M. & C. X Cuts, Thin Back.....* foot 27&28%
Peace Circular and Mill.....dis 45&10%
Peace Hand Panel and Rip.....dis 20&10 @ 20&10&10%
Peace Cross Cut, Standard.....* foot 25%
Peace Cross Cut, Thin Back.....* foot 27&28%
Richardson's Circular and Mill.....dis 45 @ 45&10%
Richardson's X-Cuts, No. 1, 30¢; No. 2, 27¢; No. 3, 24¢

Hack Saws.
Griffin's Hack Saws, complete.....dis 40&10 @ 50%
Griffin's Hack Saw, Blades only.....dis 40&10 @ 50%
Star Hack Saws and Blades.....dis 25%
Diamond Hack Saws and Blades.....dis 25%
Eureka and Crescent.....dis 25%

Saw Frames.
White Vermont.....* gro \$9 @ \$10
Red, Polished, and Varnished.....* dos \$1.50, dis 25%

Saw Sets.
Stillman's Genuine.....* dos \$5.00 and \$7.75, dis 40&5%
Stillman's Imita.....* dos \$3.25 and \$5.25, dis 40&5% @ 40&10%
Common Lever.....* dos \$2.00, dis 40&5%
Morrell's No. 1, \$15.00; Nos. 3 & 4, \$24.....dis 40&10&50%
Leach's.....No. 6, \$3.00; No. 1, \$15.00, dis 15 @ 20%
Nash's.....dis 30&10 @ 30&10&10%
Hammer, Hotchkiss.....\$5.50, dis 10%
Hammer, Bemis & Call Co.'s new Patent.....dis 30&5%
Bemis & Call Co.'s Lever and Spring Hammer.....dis 30&5%
Bemis & Call Co.'s Plate.....dis 10%
Bemis & Call Co.'s Cross Cut.....dis 12 1/2%
Alken's Genuine.....\$13.00, dis 50&10%
Alken's Imitation.....\$7.00, dis 55&5%
Hart's Patent Lever.....dis 30%
Diction's, Star, \$9, No. 15, \$5.50, dis 20&10 @ 20&10&10%
Atkins' Lever.....per doz No. 1, \$6.00; No. 2, \$6.00
Atkins' Criterion.....per doz \$7.00 @ \$7.50
Croissant Keller, No. 1, \$15.00; No. 2, \$24.00, dis 33 1/2&10%

Saw Tools.
Atkins Perfection.....\$15.00; Excelsior \$6.00 * dos.

Scales.
Hatch, Counter, No. 171, good quality.....* dos \$21
Hatch, Tea, No. 161.....* dos \$6.75 @ \$7.00
Union Platform, Plain.....\$2.30 @ 2.35
Union Platform, Striped.....\$2.40 @ 2.50
Chatillon's Grocers' Trip Scales.....dis 50%
Chatillon's Eureka.....dis 25%
Chatillon's Favorite.....dis 40%
Family, Turnbull's.....dis 30&30&10%

Scale Beams.
Scale Beams, List of Jan. 12, 32, dis 50&10 @ 50&10&5%
Scale Beam, Counter.....dis 30&33 1/2%
Chatillon's No. 1.....dis 40%
Chatillon's No. 2.....dis 50%

Scrapers.
Adjustable Box Scraper (R. & L. Co.) \$6.50, dis 30&10%
Box, 1 Handle.....* dos \$4.00, dis 10%
Box, 2 Handle.....* dos \$6.00, dis 10%
Defiance Box and Ship.....dis 20&10%
Foot.....dis 50&10&60%
Ship, Common.....* dos \$3.50 net
Ship, Providence Tool Co.....dis 10%

Screen Window and Door Frames.
Porter's Pat. Window and Door Frame.....dis 33 1/2&10%
Screen Corner Irons, Warner's.....dis 33 1/2 @ 33 1/2&10%
Stearns' Frames and Corners.....dis 25&10%

Screw Drivers.
Douglas Mfg. Co.....dis 20&10&10%
Diction's.....dis 45&10%
Diction's Patent Excelsior.....dis 45&10%
Buck Bros.....dis 30%
Stanley R. & L. Co.'s Varnished Handles.....dis 65&10%
Stanley R. & L. Co.'s Black Handles.....dis 60&10%
Sargent & Co.'s No. 1 Forged Blade.....dis 70&10&10%
Sargent & Co.'s No. 20.....dis 60&5% @ 60&10%
Sargent & Co.'s No. 40 & 30 Cast Steel.....dis 60&10%
Sargent & Co.'s No. 60, Round Blade.....dis 70&10%
Knapp & Cowles' No. 1.....dis 60&20 @ 70%
Knapp & Cowles' No. 1 Extra.....dis 60 @ 60&10%
Knapp & Cowles' No. 60 & 4.....dis 50&5 @ 50&10%
Stearns'.....dis 25&10&5%
Gay & Parsons.....dis 30%
Champion.....dis 25%
Clark's Patent.....dis 30 @ 33 1/2%
Crawford's Adjustable.....dis 30%
Ellrich's Socket and Ratchet.....dis 25 @ 25&10%
Allard's Spiral, new list.....dis 45%
Kolb's Common Sense.....* dos \$6, dis 25&10%

Screw Driver Bits.—dis 30 & 30 & 5
Screw Driver Bits. dis 30 & 30 & 5
Screw Driver Bits. dis 30 & 30 & 5
P. D. & Co.'s All Steel. dis 60 %

Screws.
Wood Screws.—List, Brass, Jan 27; Iron, July 1, 1887
Flat Head Iron. dis 70 %
Round Head Iron. dis 65 %
Flat Head Brass. dis 65 %
Round Head Brass. dis 65 %
Flat Head Bronze. dis 65 %
Round Head Bronze. dis 60 %

Machine.
Flat Head, Iron. dis 55 %
Round Head, Iron. dis 50 %

Bench and Hand.
Bench, Iron. dis 55 & 10 @ 55 & 10 & 10
Bench, Wood, Bench. dis 22 \$
Bench, Wood, Hickory. dis 20 & 10
Hand, Wood. dis 25 & 10 @ 25 & 10 & 10
Blunt Point. dis 60 %
Coach and Lag, Gimlet Point. dis 25 & 10
Bed. dis 25 & 10
Hand Rail, Sargent's. dis 60 & 10
Hand Rail, Humason, Beckley & Co.'s. dis 70 & 10 @ 75
Hand Rail, Am. Screw Co. dis 75 %
Jack Screws, Millers Falls list. dis 50 @ 50 & 5
Jack Screws, P. S. & W. dis 60 & 10
Jack Screws, Sargent. dis 60 & 10
Jack Screws, Stearns. dis 40 @ 40 & 10

Screw Mills.
Lester, complete, \$10.00. dis 25 %
Rogers, complete, \$4.00. dis 25 %

Keyhole Seats. dis 50 & 10 @ 60 %

Shears.
American Cast Iron. dis 75 & 10 @ 75 & 10 & 5
Pruning. See Pruning Hooks and Shears
Bernard's Lamp Trimmers. dis 37 \$
Timmer's. dis 20 & 10
Seymour's, List, Dec. 1881 dis 60 & 10 @ 60 & 10 & 5
Hickory, List, Dec. 1881 dis 60 & 10 @ 60 & 10 & 5
Heinrich's Tailor's Shears. dis 35 %
First quality C. S. Trimmers. dis 60 & 10
Second quality C. S. Trimmers. dis 60 & 10 @ 10 & 10
Acme Cast Shears. dis 10 & 10
Diamond Cast Shears. dis 10 & 10
Clippers. dis 10 & 10
Howe Bros. & Hulbert, Solid Forged Steel. dis 40 %
Cleveland Machine Co., Solid Steel Forged. dis 70 %

Knives.
Sliding Door.
M. W. & Co., List Jan. 1, 1887. dis 50 & 10 @ 60 & 5
R. & E. list Dec. 18, 1885. dis 55 & 10
Corbin's list. dis 60 & 10 & 10
Patent Roller. dis 60 & 10 & 10
Russell's Anti-Friction, list Dec. 18, 1885. dis 60 & 10
Moore's Anti-Friction. dis 60
Sliding Shutter.
R. & E. list Dec. 18, 1885. dis 60 & 10 & 10
Sargent's list. dis 60 & 10
Kendall list. dis 60 & 10 & 10

Ship Tools.
L. & J. dis 20 & 10
Albertson Mfg. Co. dis 25 %

Shoes, Horse, Mule, &c.
Burden's, Perkins', Phoenix, at factory. \$4.00
Mule.—Add \$1 x keg to above prices.
Oz. Wrought—
Ton lots. \$9 00
500 lb lots. \$9 00
Shot.—(Eastern prices, 2¢ off, cash, 5 days.)
Drop, # bag, 5 lb. \$1.50
Drop, # bag, 5 lb. \$1.35
Buck and Chilled, # 25 lb bag. \$1.75
Buck and Chilled, # 5 lb bag. \$1.40
Drop Shot, # bag, 25 lb. \$1.50
Drop Shot, # bag, 5 lb. \$1.35
Buck and Chilled Shot, # bag, 25 lb. \$1.75
Buck and Chilled Shot, # bag, 5 lb. \$1.40
Western prices, 2¢ off, cash, 5 days.

Shovels and Spades.
Ames' Shovels, Spades, &c., list Nov. 1, 1885. dis 30 %
Norton.—Jobbers frequently give 5 @ 7% extra on above.
Griffin's Black Iron. dis 60 & 10
Griffin's C. S. dis 60 @ 60 & 10
Griffin's Solid Steel R. R. Goods. dis 20 %
Old Colony (Sanford Fork & Tool Co.). dis 20 %
St. Louis Shovel Co. dis 15 @ 15 & 7 %
Hussey, Binns & Co. dis 15 @ 15 %
Hubbard & Co. dis 20 @ 20 & 7 %
Lehigh Mfg. Co. dis 60 & 10
Payne Pettibone & Son, list January, 1886. dis 30 %
Remington's Lowest Steel R. R. Goods. dis 30 & 10 @ 40 %
Rowland's Black Iron. dis 60 & 10
Rowland's Steel. dis 60 & 10 @ 60 & 10

Shovels and Tongs.
Iron Head. dis 60 & 10 @ 60 & 10 & 5
Brass Head. dis 60 & 10 & 10

Skins, Thimble.
Western list. dis 75 @ 75 & 10
Columbus Wrt. Steel, list Nov. 1, 1887. dis 20 %
Coldbrookdale Iron Co. dis 50 & 10 %

Sieves.
Buffalo Metallic, S. B. & Co., new list. dis 60 & 10
Barber Flour Sifters. dis 32 \$
Smith's Adjustable Milk Strainer. dis 22 \$
Smith's Adjustable F. & C. Strainer. dis 17 \$
Sieves, Wooden Rim—Iron, Plated.
Mesh 18, Nested, # doz. 70 \$
Mesh 20, Nested, # doz. 80 \$
Mesh 24, Nested, # doz. 1.00
Slates.—School, by case. 0 & 10

Snaps, Harness, &c.
Anchor (T. & S. Mfg Co.). dis 60 %
Hotchkiss. dis 60 %
Argonne. dis 60 %
Sargent's Patent Guarded. dis 70 & 10 @ 10
German, new list. dis 40 & 10
Covert. dis 50 & 10
Covert, new patent. dis 50 & 10
Covert Sewer. dis 60 & 10
Covered Spring. dis 60 & 10 & 10

Soldering Irons.
Covert's Adjustable, list Jan. 1, 1886. dis 35 & 10

Spoke Shaves.—Iron. dis 45 %
Woods. dis 45 %
Bailey's (Stanley B. & L. Co.). dis 40 & 10
Stearns'. dis 20 & 10 @ 30 %

Spoke Trimmers.
Bonney's. dis \$10.00, dis 50 %
Stearns'. dis 20 & 10
Ives'. No. 1, \$16.00; No. 2, \$12.00 # doz, dis 55 & 10
Douglas'. # doz \$30.00, dis 30 %

Spoons and Forks.
Tinned Iron.
Baldwin, Central Stamping Co.'s list. dis 70 & 10 @ 10
Baldwin, Central Stamping Co.'s list. dis 70 & 10 @ 10
Baldwin, B. B. & Co. dis 35 & 10 & 10

Steel Plates.—4 mos. or 5 % cash 30 days.
Meriden Brit. Co., Rogers. dis 50 %
C. Rogers & Bro. dis 50 %
Rogers & Bro. dis 50 %
Reed & Barton. dis 50 %
Wm. Rogers mfg. Co. dis 50 @ 50 & 10
Simmons, Hall, Miller & Co. dis 50 @ 50 & 10
Holmes & Edwards Silver Co. dis 50 @ 50 & 10
H. & E. Silver Co., Mexican Silver. dis 50 & 10
H. & E. Silver Co., Durham Silver. dis 50 & 10
German Silver. dis 50 @ 50 & 10
German Silver, Hall & Elton. dis 40 & 10
Nickel Silver. dis 50 & 10 @ 50 & 10 & 5, cash
Britannia. dis 55 %

Spring.
Ell pte. Concord, Platform and Half Scroll. dis 60 @ 60 & 5
Chas. Bolster Springs. dis 20 %

Squares.
Steel and Iron. dis 70 & 10
Nickel Plated. dis 70 & 10
Try Square and T Bevels. dis 60 & 10 @ 70 %
Dixton's Try Square and T Bevels. dis 45 & 10
Winterbottom's Try and Miter. dis 30 & 10

Staples.
Fence Staples, Galvanized. dis 4 @ 4 & 10
Fence Staples, Plain. dis 3 @ 3 & 10
Steelyards. dis 40 & 10 @ 50 & 10

Stocks and Dies.
Blacksmith's, Waterford Goods. dis 30 & 10 @ 30 & 10
Lightning Screw Plate. dis 25 @ 30 %
Reece's New Screw Plates. dis 33 & 10 @ 33 & 10

Stone.
Hindustan No. 1, 3/4; Axe, 3/4; Slips No. 1, 5/8. dis 24
Washtita Stone, Extra. dis 15 @ 15 & 10
Washtita Stone, No. 1. dis 15 @ 15 & 10
Washtita Stone, No. 2. dis 11 @ 12 & 10
Washtita Slips, No. 1, Extra. dis 40 @ 40 & 10
Washtita Slips, No. 1.

